

MiRiCi-E3T3

Intelligent Miniature Ethernet to E3/T3
Remote Bridge

Version 2.2



data communications

The Access Company

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Installation and Operation Manual

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For further information contact RAD at the address below or contact your local distributor.

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Product Disposal



To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.

General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

Safety Symbols



This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.



Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.



Protective ground: the marked lug or terminal should be connected to the building protective ground bus.



Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached.

Please observe the following precautions:

- Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.
- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.
- The use of optical devices with the equipment will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

ATTENTION: The laser beam may be invisible!

In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

Handling Energized Products

General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective ground terminal. If a ground lug is provided on the product, it should be connected to the protective ground at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in grounded racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

Some products may have panels secured by thumbscrews with a slotted head. These panels may cover hazardous circuits or parts, such as power supplies. These thumbscrews should therefore always be tightened securely with a screwdriver after both initial installation and subsequent access to the panels.

Connecting AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

Connecting DC Power

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded.

Due to the high current capability of DC power systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

DC units should be installed in a restricted access area, i.e. an area where access is authorized only to qualified service and maintenance personnel.

Make sure that the DC power supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation.

If the DC power supply is floating, the switch must disconnect both poles simultaneously.

Connecting Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1 Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2 Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3 Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The grounding and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk, there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

Caution

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.

Attention

Pour réduire les risques d'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.

Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good ground connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the ground bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching ground or wear an ESD preventive wrist strap.

FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Emission Requirements

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Warning per EN 55022 (CISPR-22)

Warning

This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.

Avertissement

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

Achtung

Das vorliegende Gerät fällt unter die Funkstörgrenzwertklasse A. In Wohngebieten können beim Betrieb dieses Gerätes Rundfunkstörungen auftreten, für deren Behebung der Benutzer verantwortlich ist.

Mise au rebut du produit



Afin de faciliter la réutilisation, le recyclage ainsi que d'autres formes de récupération d'équipement mis au rebut dans le cadre de la protection de l'environnement, il est demandé au propriétaire de ce produit RAD de ne pas mettre ce dernier au rebut en tant que déchet municipal non trié, une fois que le produit est arrivé en fin de cycle de vie. Le client devrait proposer des solutions de réutilisation, de recyclage ou toute autre forme de mise au rebut de cette unité dans un esprit de protection de l'environnement, lorsqu'il aura fini de l'utiliser.

Instructions générales de sécurité

Les instructions suivantes servent de guide général d'installation et d'opération sécurisées des produits de télécommunications. Des instructions supplémentaires sont éventuellement indiquées dans le manuel.

Symboles de sécurité



Avertissement

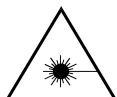
Ce symbole peut apparaître sur l'équipement ou dans le texte. Il indique des risques potentiels de sécurité pour l'opérateur ou le personnel de service, quant à l'opération du produit ou à sa maintenance.



Danger de choc électrique ! Evitez tout contact avec la surface marquée tant que le produit est sous tension ou connecté à des lignes externes de télécommunications.



Mise à la terre de protection : la cosse ou la borne marquée devrait être connectée à la prise de terre de protection du bâtiment.



Avertissement

Certains produits peuvent être équipés d'une diode laser. Dans de tels cas, une étiquette indiquant la classe laser ainsi que d'autres avertissements, le cas échéant, sera jointe près du transmetteur optique. Le symbole d'avertissement laser peut aussi être joint.

Veuillez observer les précautions suivantes :

- Avant la mise en marche de l'équipement, assurez-vous que le câble de fibre optique est intact et qu'il est connecté au transmetteur.
- Ne tentez pas d'ajuster le courant de la commande laser.
- N'utilisez pas des câbles ou connecteurs de fibre optique cassés ou sans terminaison et n'observez pas directement un rayon laser.
- L'usage de périphériques optiques avec l'équipement augmentera le risque pour les yeux.
- L'usage de contrôles, ajustages ou procédures autres que celles spécifiées ici pourrait résulter en une dangereuse exposition aux radiations.

ATTENTION : Le rayon laser peut être invisible !

Les utilisateurs pourront, dans certains cas, insérer leurs propres émetteurs-récepteurs Laser SFP dans le produit. Les utilisateurs sont avertis que RAD ne pourra pas être tenue responsable de tout dommage pouvant résulter de l'utilisation d'émetteurs-récepteurs non conformes. Plus particulièrement, les utilisateurs sont avertis de n'utiliser que des produits approuvés par l'agence et conformes à la réglementation locale de sécurité laser pour les produits laser de classe 1.

Respectez toujours les précautions standards de sécurité durant l'installation, l'opération et la maintenance de ce produit. Seul le personnel de service qualifié et autorisé devrait effectuer l'ajustage, la maintenance ou les réparations de ce produit. Aucune opération d'installation, d'ajustage, de maintenance ou de réparation ne devrait être effectuée par l'opérateur ou l'utilisateur.

Manipuler des produits sous tension

Règles générales de sécurité

Ne pas toucher ou altérer l'alimentation en courant lorsque le câble d'alimentation est branché. Des tensions de lignes peuvent être présentes dans certains produits, même lorsque le commutateur (s'il est installé) est en position OFF ou si le fusible est rompu. Pour les produits alimentés par CC, les niveaux de tension ne sont généralement pas dangereux mais des risques de courant peuvent toujours exister.

Avant de travailler sur un équipement connecté aux lignes de tension ou de télécommunications, retirez vos bijoux ou tout autre objet métallique pouvant venir en contact avec les pièces sous tension.

Sauf s'il en est autrement indiqué, tous les produits sont destinés à être mis à la terre durant l'usage normal. La mise à la terre est fournie par la connexion de la fiche principale à une prise murale équipée d'une borne protectrice de mise à la terre. Si une cosse de mise à la terre est fournie avec le produit, elle devrait être connectée à tout moment à une mise à la terre de protection par un conducteur de diamètre 18 AWG ou plus. L'équipement monté en châssis ne devrait être monté que sur des châssis et dans des armoires mises à la terre.

Branchez toujours la mise à la terre en premier et débranchez-la en dernier. Ne branchez pas des câbles de télécommunications à un équipement qui n'est pas mis à la terre. Assurez-vous que tous les autres câbles sont débranchés avant de déconnecter la mise à la terre.

Connexion au courant du secteur

Assurez-vous que l'installation électrique est conforme à la réglementation locale.

Branchez toujours la fiche de secteur à une prise murale équipée d'une borne protectrice de mise à la terre.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A. Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A.

Branchez toujours le câble d'alimentation en premier à l'équipement puis à la prise murale. Si un commutateur est fourni avec l'équipement, fixez-le en position OFF. Si le câble d'alimentation ne peut pas être facilement débranché en cas d'urgence, assurez-vous qu'un coupe-circuit ou un disjoncteur d'urgence facilement accessible est installé dans l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si le système de distribution de courant est de type IT.

Connexion d'alimentation CC

Sauf s'il en est autrement spécifié dans le manuel, l'entrée CC de l'équipement est flottante par rapport à la mise à la terre. Tout pôle doit être mis à la terre en externe.

A cause de la capacité de courant des systèmes à alimentation CC, des précautions devraient être prises lors de la connexion de l'alimentation CC pour éviter des courts-circuits et des risques d'incendie.

Les unités CC devraient être installées dans une zone à accès restreint, une zone où l'accès n'est autorisé qu'au personnel qualifié de service et de maintenance.

Assurez-vous que l'alimentation CC est isolée de toute source de courant CA (secteur) et que l'installation est conforme à la réglementation locale.

La capacité maximale permissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A. Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A.

Avant la connexion des câbles d'alimentation en courant CC, assurez-vous que le circuit CC n'est pas sous tension. Localisez le coupe-circuit dans le tableau desservant l'équipement et fixez-le en position OFF. Lors de la connexion de câbles d'alimentation CC, connectez d'abord le conducteur de mise à la terre à la borne correspondante, puis le pôle positif et en dernier, le pôle négatif. Remettez le coupe-circuit en position ON.

Un disjoncteur facilement accessible, adapté et approuvé devrait être intégré à l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si l'alimentation en courant CC est flottante.

Glossary

Address	A coded representation of the origin or destination of data.
AIS (Alarm Indication Signal)	One of the OAM function types used for fault management (see also CC).
Analog	A continuous wave or signal (such as human voice).
AWG	The American Wire Gauge System, which specifies wire width.
Balanced	A transmission line in which voltages on the two conductors are equal in magnitude, but opposite in polarity, with respect to ground.
Bandwidth	The range of frequencies passing through a given circuit. The greater the bandwidth, the more information can be sent through the circuit in a given amount of time.
Bipolar	Signaling method in E3/T3 representing a binary "1" by alternating positive and negative pulses, and a binary "0" by absence of pulses.
Bit	The smallest unit of information in a binary system. Represents either a one or zero ("1" or "0").
Bridge	A device interconnecting local area networks at the OSI data link layer, filtering and forwarding frames according to media access control (MAC) addresses.
Buffer	A storage device. Commonly used to compensate for differences in data rates or event timing when transmitting from one device to another. Also used to remove jitter.
Bus	A transmission path or channel. A bus is typically an electrical connection with one or more conductors, where all attached devices receive all transmissions at the same time.
Byte	A group of bits (normally 8 bits in length).
CC (Continuity Check)	A frame used periodically to check whether a connection is idle or has failed. Continuity checking is one of the OAM function types for fault management.
cHDL	A Cisco proprietary version of the HDLC protocol.
Carrier	A continuous signal at a fixed frequency that is capable of being modulated with a second (information carrying) signal.
Channel	A path for electrical transmission between two or more points. Also called a link, line, circuit or facility.
Clock	A term for the source(s) of timing signals used in synchronous transmission.

Data	Information represented in digital form, including voice, text, facsimile and video.
Data Link Layer	Layer 2 of the OSI model. The entity, which establishes, maintains, and releases data-link connections between elements in a network. Layer 2 is concerned with the transmission of units of information, or frames, and associated error checking.
Diagnostics	The detection and isolation of a malfunction or mistake in a communications device, network or system.
Digital	The binary ("1" or "0") output of a computer or terminal. In data communications, an alternating, non-continuous (pulsating) signal.
E3	The European standard for high speed digital transmission, operating at 34 Mbps.
Encapsulation	Encapsulating data is a technique used by layered protocols in which a low level protocol accepts a message from a higher level protocol, then places it in the data portion of the lower-level frame. The logistics of encapsulation require that packets traveling over a physical network contain a sequence of headers.
Ethernet	A local area network (LAN) technology which has extended into the wide area networks. Ethernet operates at many speeds, including data rates of 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet), 1,000 Mbps (Gigabit Ethernet), 10 Gbps, 40 Gbps, and 100 Gbps.
Flow Control	A congestion control mechanism that results in an ATM system implementing flow control.
Frame	A logical grouping of information sent as a link-layer unit over a transmission medium. The terms packet, datagram, segment, and message are also used to describe logical information groupings.
Framing	At the physical and data link layers of the OSI model, bits are fit into units called frames. Frames contain source and destination information, flags to designate the start and end of the frame, plus information about the integrity of the frame. All other information, such as network protocols and the actual payload of data, is encapsulated in a packet, which is encapsulated in the frame.
Full Duplex	A circuit or device permitting transmission in two directions (sending and receiving) at the same time.
FXO (Foreign Exchange Office)	A voice interface, emulating a PBX extension, as it appears to the CO (Central Office) for connecting a PBX extension to a multiplexer.
FXS (Foreign Exchange Subscriber)	A voice interface, emulating the extension interface of a PBX (or subscriber interface of a CO) for connecting a regular telephone set to a multiplexer.
G.703	An ITU standard for the physical and electrical characteristics of various digital interfaces, including those at 64 kbps and 2.048 Mbps.

Gateway	Gateways are points of entrance and exit from a communications network. Viewed as a physical entity, a gateway is that node that translates between two otherwise incompatible networks or network segments. Gateways perform code and protocol conversion to facilitate traffic between data highways of differing architecture.
GFP (Generic Framing Procedure)	Defined by ITU-T G.7041, generic framing procedure allows efficient mapping of variable length, higher-layer client signals, such as Ethernet, over a transport network like SDH/SONET. Recently, GFP has been extended to lower speed PDH networks.
HDLC (High-Level Data Link Control)	A synchronous, bit-oriented link layer protocol for data transmission. Frame Relay is an example of an HDLCbased packet protocol.
Impedance	The combined effect of resistance, inductance and capacitance on a transmitted signal. Impedance varies at different frequencies.
Interface	A shared boundary, defined by common physical interconnection characteristics, signal characteristics, and meanings of exchanged signals.
IP Address	Also known as an Internet address. A unique string of numbers that identifies a computer or device on a TCP/IP network. The format of an IP address is a 32-bit numeric address written as four numbers from 0 to 255, separated by periods (for example, 1.0.255.123).
Jitter	The deviation of a transmission signal in time or phase. It can introduce errors and loss of synchronization in high speed synchronous communications.
Laser	A device that transmits an extremely narrow and coherent beam of electromagnetic energy in the visible light spectrum. Used as a light source for fiber optic transmission (generally more expensive, shorter lived, single mode only, for greater distances than LED).
Leased Line	A permanent telephone connection between two points that is rented for exclusive use from a telecommunications common carrier. In contrast to a normal dial-up connection, a leased line is always active. Typically, the highest speed data connections require a leased line connection. For example, a T1 channel is a type of leased line that provides a maximum transmission speed of 1.544 Mbps.
Loopback	A type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all or part of a communications link or network.
Mark	In telecommunications, this means the presence of a signal. A mark is equivalent to a binary 1. A mark is the opposite of a space (0).
Multiplexer	At one end of a communications link, a device that combines several lower speed transmission channels into a single high speed channel. A multiplexer at the other end reverses the process. Sometimes called a mux. See Bit Interleaving/Multiplexing .

Network	(1) An interconnected group of nodes. (2) A series of points, nodes, or stations connected by communications channels; the collection of equipment through which connections are made between data stations.
Node	A point of interconnection to a network.
Packet	An ordered group of data and control signals transmitted through a network, as a subset of a larger message.
parameters	Parameters are often called arguments, and the two words are used interchangeably. However, some computer languages such as C define argument to mean actual parameter (i.e., the value), and parameter to mean formal parameter. In RAD CLI, parameter means formal parameter, not value.
Payload	The 48-byte segment of the ATM cell containing user data. Any adaptation of user data via the AAL will take place within the payload.
Physical Layer	Layer 1 of the OSI model. The layer concerned with electrical, mechanical, and handshaking procedures over the interface connecting a device to the transmission medium.
Port	The physical interface to a computer or multiplexer, for connection of terminals and modems.
Protocol	A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.
SFP (Small Form-factor Pluggable)	A compact optical transceiver used in optical communications. It interfaces a network device (a switch, router or similar device) to a fiber optic or unshielded twisted pair networking cable. It is a popular industry format.
Single Mode	Describing an optical wave-guide or fiber that is designed to propagate light of only a single wavelength (typically 5-10 microns in diameter).
Space	In telecommunications, the absence of a signal. Equivalent to a binary 0.
Synchronous Transmission	Transmission in which data bits are sent at a fixed rate, with the transmitter and receiver synchronized.
T1	A digital transmission link with a capacity of 1.544 Mbps used in North America. Typically channelized into 24 DS0s, each capable of carrying a single voice conversation or data stream. Uses two pairs of twisted pair wires.
T3	A digital transmission link with a capacity of 45 Mbps, or 28 T1 lines.

Quick Start Guide

This quick start guide instructs you on getting started with MiRiCi-E3T3 and upgrading software when necessary. It is divided into the following sections:

- Configuring MiRiCi-E3T3 for first use
- Connecting MiRiCi-E3T3 to a host device
- Replacing MiRiCi-E3T3's software.

1. Configuring MiRiCi-E3T3 for First Use

Before you can start using MiRiCi-E3T3, you have to assign an IP address to the device and specify a mode of operation. To do so, connect MiRiCi-E3T3 to a PC via RAD's SFP-CA adaptor as illustrated in [Figure 2](#).

When you connect SFP-CA to a specific PC for the first time, you have to install the SFP-CA driver on that PC, and configure the PC network parameters for communication with SFP-CA. The driver installation requires a PC that has the Windows XP operating system with Service Pack 2.

► **To install the SFP-CA driver on a PC:**

1. Insert the Technical Documentation CD into the CD drive of the PC.

The CD main menu appears.

2. Click the link to the MiRiC/MiRiCi Family product page.

The MiRiC/MiRiCi Family product page appears, with an entry for the SFP-CA documentation and driver.

3. Click the SFP-CA driver link.

The SFP-CA driver is installed in the background. No further action is required to install the driver.

► **To connect MiRiCi-E3T3 to a PC:**

1. Ensure that you have installed the SFP-CA driver on the PC as explained above.
2. Enable Configuration mode for MiRiCi-E3T3 by setting both DIP switches on the device's underside to **ON**.

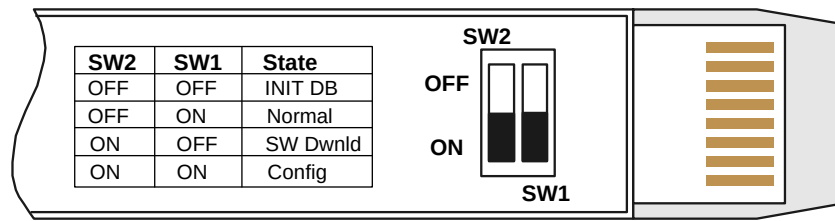


Figure 1. DIP Switches on MiRiCi-E3T3's Underside

3. Connect the DC adapter to the SFP-CA configuration module and use the power cord to connect the DC adapter to the mains.
4. Connect the SFP-CA configuration module to a free USB port on your PC and then carefully plug MiRiCi-E3T3 into the socket on the opposite side of SFP-CA.

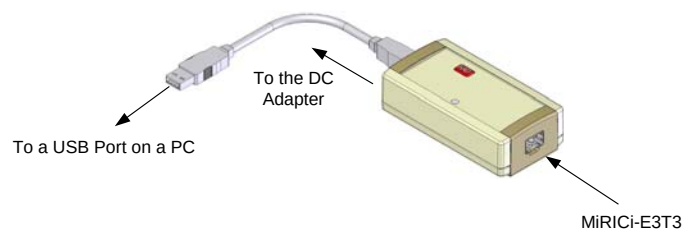


Figure 2. SFP-CA Configuration Module

► **To configure the PC network parameters for the SFP-CA connection to MiRiCi-E3T3:**

1. From the Windows Start menu, navigate to the Control Panel, and open **Network Connections**.
A new local area network connection appears in the list of network connections. If you switch to the Details view, the device name **ADMTEK ADM8511 USB TO FAST ETHERNET CONVERTER** appears.
2. Right-click this network connection, and select **Properties**.
The Local Area Connection Properties dialog box appears with the General tab open.
3. To the upper right, click **Configure** and then select the **Advanced** tab.
The Network Connection Properties dialog box appears, containing properties associated with the USB configuration adapter.
4. Under **Property**, select **Select Media**. Under **Value**, select **Home LAN**, and then click **OK**.
The dialog box closes and your settings are applied.
5. Open the Properties window again as explained above and double-click **Internet Protocol (TCP/IP)**.
The Internet Protocol (TCP/IP) dialog box appears.
6. To enable entering TCP/IP settings, select **Use the following IP Address**.
The IP Address, the Subnet Mask, and the Default Gateway field become available.

7. Enter the following TCP/IP settings and then click **OK**:

- **IP Address:** 192.168.205.20
- **Subnet Mask:** 255.255.255.0
- **Default Gateway:** 192.168.205.1

The PC communication link with SFP-CA and MiRiCi-E3T3 is ready.

➤ **To change the IP address to integrate MiRiCi-E3T3 into the network:**

1. Leave MiRiCi-E3T3 connected to the PC via SFP-CA.
2. Enter **http://192.168.205.1** into the Web browser's address field.

The Opening screen appears.

3. Click **Login**.

The Login screen appears.

4. Enter the default user name and password, and then click **Submit**. The default user name and the password are as follows:

- **User Name:** su
- **Password:** 1234

A menu appears to the left and you are able to configure MiRiCi-E3T3.

5. Navigate to **Configuration > System > Management > Host IP**.

The Host IP menu appears.

6. Type the new IP address into the Host IP field and then click **Save**.

The new IP address is assigned. You may continue specifying additional parameters or connect to MiRiCi-E3T3 from any PC on your network at a later stage using the newly assigned IP address.

➤ **Before you disconnect MiRiCi-E3T3:**

1. Close all relevant management applications.
2. In the taskbar, double-click the Safely Remove Hardware icon.

The Safely Remove Hardware screen appears listing all USB devices currently connected to your PC.

3. Select **ADM8511 USB To Fast Ethernet Adapter** from the Safely Remove Hardware screen and click **Stop**.

A message appears confirming that you can safely remove the device.

➤ **To disconnect MiRiCi-E3T3 from the PC:**

1. Push the release button at the front of MiRiCi-E3T3 to disconnect it from SFP-CA, and then eject MiRiCi-E3T3 from the USB socket on SFP-CA.
2. Disconnect SFP-CA from the PC and from the power.

-
- Note**
- *If you disconnect MiRiCi-E3T3 and/or the SFP-CA module before releasing it, your PC may stop responding.*
 - *All SFP-CA modules have the same MAC address (00-00-E8-00-00-01).*
-

2. Connecting MiRiCi-E3T3 to the Host

Note *You do not have to switch off the host unit when inserting or extracting the MiRiCi-E3T3 device.*

➤ **To insert MiRiCi-E3T3:**

1. Set the DIP switches on MiRiCi-E3T3's underside to enable normal working mode (see [Figure 1](#)).
2. Plug MiRiCi-E3T3 into a free SFP (MSA-compatible) socket of the host device. Make sure that MiRiCi-E3T3 is pressed firmly into the MSA SFP port connector.

The device is ready to operate once the LOS LED has blinked three times.

Note *When MiRiCi-E3T3 is inserted into the host, the LOS LED blinks three times if the device is in normal or CONFIG mode; or blinks continuously if the device is in INIT DB mode. The LOS LED stays OFF if the device is in SW Dwnld mode.*

➤ **To connect to the E3/T3:**

- Use the miniature BNC cables (included in the MiRiCi-E3T3 package) to connect MiRiCi-E3T3 to the coaxial E3/T3 line.

➤ **To eject MiRiCi-E3T3:**

1. Disconnect cables attached to MiRiCi-E3T3.
2. Push the release button on the front of MiRiCi-E3T3. This extracts the device from the edge connector.
3. Remove MiRiCi-E3T3 from the socket.

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Chapter 1

Introduction

1.1 Overview

MiRiCi-E3T3 is a remote bridge that forwards Fast Ethernet or Gigabit Ethernet LAN packets to TDM-based WAN at full duplex wire-speed, fully utilizing the expensive E3/T3 rate TDM circuit bandwidth.

Applications

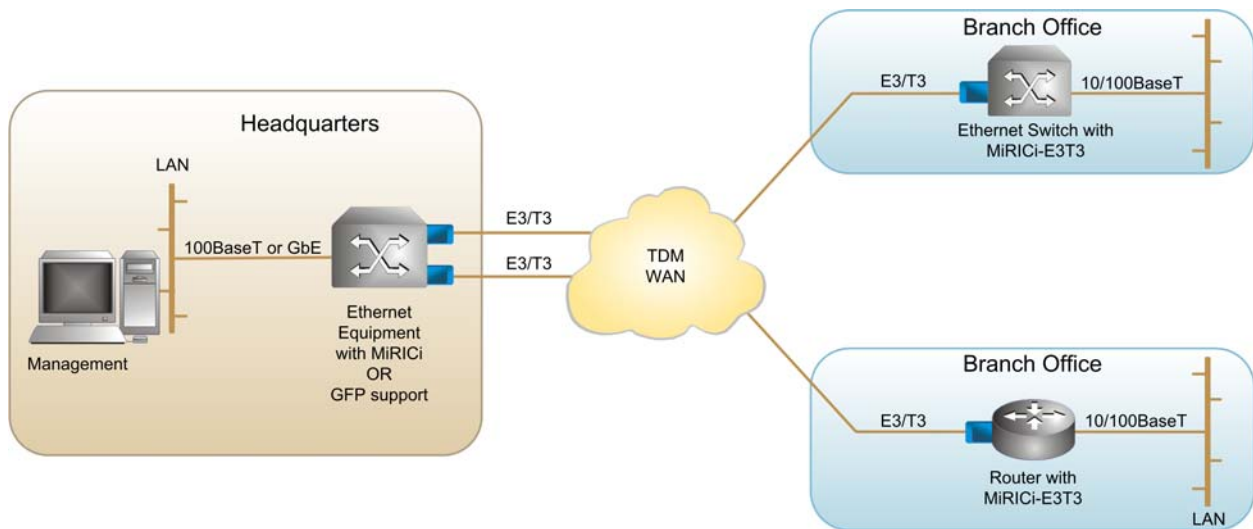


Figure 1-1. Providing Transparent LAN Services over Leased Lines

Features

MiRiCi-E3T3 supports the following basic features:

- Framed or unframed for E3/T3 links
- Standard encapsulation via GFP, HDLC/cHDLC
- Management for configuration, status, and diagnostics.
- Hot-insertion SFP footprint, MSA compliant
- Full duplex wire-speed packet forwarding
- Configurable Tx clock source for Receive or Internal clock
- Visual fault indication:
 - Loss of E3/T3 signal
 - Loss of Ethernet link
- Product identification support
- Easy release mechanism

Additional features are described in the sections below.

Flow control

A flow control mechanism is activated when LAN traffic exceeds the WAN link's (E3/T3) capacity and the watermarks of the internal frame buffer. Pause packets are transmitted to the LAN port, halting LAN traffic until the buffer has been emptied to below the watermark limit.

Fault Propagation

In case of LOS and if Fault Propagation is enabled, the LAN link is automatically disabled and the link status LED turns off. In addition, the LOS indication is propagated towards the host by sending an electrical signal via the LOS pin on the MSA edge connector. The LOS LED turns ON, visually indicating the LOS.

Quality of Service

The unit supports Quality of Service (QoS) with classification according to VLAN priority (802.1p). Classification results are mapped into four transmit priority queues with strict priority.

Loop Detection

MiRiCi-E3T3 incorporates a mechanism that detects loops on the WAN or the LAN side by transmitting special loop detection frames. When the unit recognizes that a loop exists, preventative actions are performed. Refer to [Functional Description](#) for additional information.

Encapsulation

MiRiCi-E3T3 supports the GFP-F, HDLC/cHDLC protocols.

I²C Cycle Stretching

MiRiCi-E3T3 can be configured to operate with or without I²C cycle stretching functionality. Refer to [Appendix C](#) for additional information.

Management

The unit can be managed via Web browser or I²C channel.

Detecting Errors

You can run diagnostic loopbacks on the E3/T3 ports, as well as send RDI or AIS to the TDM equipment.

You can define up to 10 management stations to which to send SNMP traps. For each management station, you can enable or disable sending traps.

Statistics

MiRiCi-E3T3 provides the following statistics:

- Ethernet statistics based on RFC 2819 (R-MON)
- E3/T3 statistics.

1.2 Physical Description

MiRiCi-E3T3 is an SFP device that is inserted into an SFP MSA compatible receptacle in a host unit.



Figure 1-2. MiRiCi-E3T3 3D View

The dimensions of MiRiCi-E3T3 are illustrated in [Figure 1-3](#).

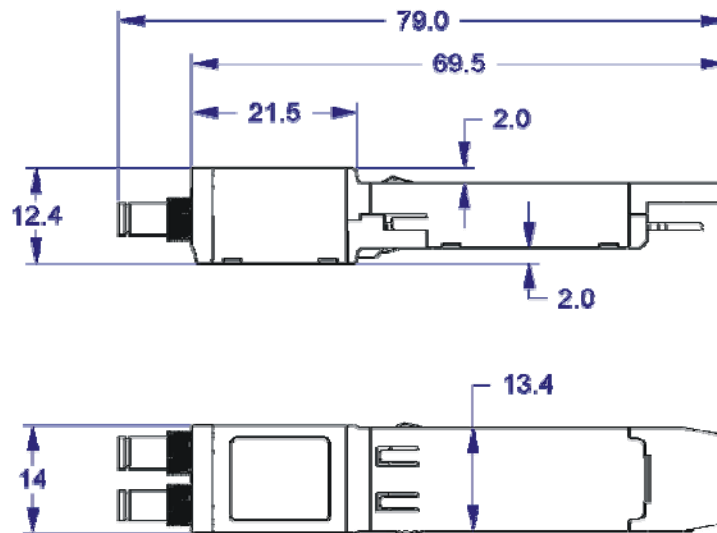


Figure 1-3. MiRiCi-E3T3 Dimensions

1.3 Functional Description

Loop Detection

MiRiCi-E3T3 incorporates a mechanism that detects loops on the WAN or the LAN side by transmitting special loop detection frames. When the unit recognizes that a loop exists, it reacts according to the following protocol:

- If a loop is detected on the LAN side, a loop detection alarm is sent.
- If a loop is detected on the WAN side, the unit blocks the traffic and a loop detection alarm is sent.

Encapsulation

GFP

MiRiCi-E3T3 supports GFP-F. This protocol maps each client frame into a single GFP frame. GFP-F is used where the client signal is framed or packetized by the client protocol. GFP-F is not supported in framed E3 mode.

HDLC/cHDLC

MiRiCi-E3T3 supports HDLC and cHDLC. The HDLC/cHDLC protocol is a layer 2 data transmission protocol that ensures error-free movement of data. It also provides a flow control mechanism.

cHDLC is a Cisco propriety version of the HDLC protocol. One of the primary reasons for the creation of cHDLC is to address the HDLC protocol's inability to provide multiprotocol support. Thus, cHDLC frames contain a field for identifying the network protocol being encapsulated.

1.4 Technical Specifications

E3 WAN INTERFACE

<i>Number of Ports</i>	1
<i>Compliance</i>	G.703, G.775, G.823, G.832
<i>Data Rate</i>	34.368 Mbps
<i>Line Code</i>	HDB3, AMI
<i>Framing</i>	Framed (G.832, G.751), unframed
<i>Line Impedance</i>	75Ω, unbalanced
<i>Transmit Clock</i>	Receive or internal clock
<i>Connector</i>	DIN 1.0/2.3
<i>Cable Length (max)</i>	275m (900 ft) with RG59 indoor cable

T3 WAN INTERFACE

<i>Number of Ports</i>	1
<i>Compliance</i>	GR-499-CORE, T1.107, T1.404, G.703, G.704, G.775, G.824
<i>Data Rate</i>	44.736 Mbps
<i>Line Code</i>	B3ZS, AMI
<i>Framing</i>	Framed (M23, C-Bit), unframed
<i>Line Impedance</i>	75Ω, unbalanced
<i>Transmit Clock</i>	Receive or internal clock
<i>Connector</i>	DIN 1.0/2.3
<i>Cable Length (max)</i>	275m (900 ft) with RG59 indoor cable

LAN INTERFACE

<i>Type</i>	Fast or Gigabit Ethernet port
<i>Compliance</i>	IEEE 802.3
<i>Edge Connector</i>	SFP transceiver, MSA compliant

<i>Frame Size</i>	MiRiCi-E3T3/FE: 64–2016 bytes MiRiCi-E3T3/GbE: Up to 10 kbytes (Jumbo)
-------------------	---

WAN PROTOCOL

<i>Encapsulation</i>	GFP-F (G.8040, G.7041/Y.1303) HDLC cHDLC
----------------------	--

GENERAL

<i>LED Indicators</i>	MiRiCi-E3T3/FE: LINK (green) – Ethernet link status MiRiCi-E3T3/GbE: LINK/ACT (green) – Ethernet link status and activity LOS (red) – E3/T3 loss of signal
<i>Power</i>	3.3V
<i>Thermal Management</i>	Power dissipation less than 1.25W
<i>Dimensions</i>	Height: 12.4 mm (0.49 in) Width: 14 mm (0.55 in) Depth: 79 mm (3.11 in) Weight 15.0 g (0.5 oz)
<i>Environment</i>	Temperature: -40 to 65°C (-40 to 149°F) Humidity: Up to 90%, non-condensing

Chapter 2

Installation and Setup

2.1 Introduction

Housed in a Small Form Factor Pluggable (SFP) package, MiRiCi-E3 and MiRiCi-T3 comply with the Multi-Source Agreement (MSA) and can be inserted into any MSA-compatible host unit.

MiRiCi-E3T3 is an autonomous plug-and-play hot-insertion module. You can configure a MiRiCi unit while it is plugged into the host device or by using RAD's SFP-CA configuration module illustrated in [Figure 2-2](#).

MiRiCi-E3T3 is equipped with DIP switches on its underside that enable setting the MiRiCi unit to various operation modes. Operation modes depend on the desired task and are listed in [Table 2-1](#) together with the associated DIP switch settings.

In addition, MiRiCi-E3T3 can be managed via an I²C Interface (out-of-band) and/or a Web-based management interface. For additional information, refer to [Chapter 4](#).

2.2 Site Requirements and Prerequisites

MiRiCi-E3T3 is intended for installation in a free SFP (MSA-compatible) socket of the host equipment.

The ambient operating temperature should be –40°C to 65°C (–40°F to 149°F), at a relative humidity of up to 90%, non-condensing.

2.3 Package Contents

The MiRiCi-E3T3 package includes the following items:

- Up to four MiRiCi-E3T3 units
- Two adapter cables CBL-1023-BNC.
- SFP-CA configuration adapter module (if ordered).

2.4 Required Equipment

MiRiCi-E3T3 requires no special tools for installation.

2.5 Setting the Switches

MiRiCi-E3T3 includes a 2-section DIP switch used to select one of the following working modes of the device:

- Database initialization
- Normal operation
- Software download
- Configuration.

► **To select the working mode:**

- On MiRiCi-E3T3's underside, set the DIP switches as listed in [Table 2-1](#) to enable the desired working mode.

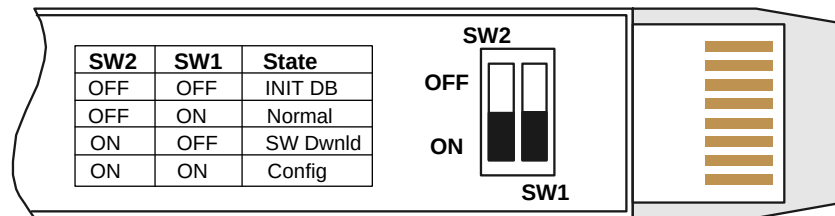


Figure 2-1. DIP Switch Location

Table 2-1. DIP Switch Settings

Switch Position		Function
SW2	SW1	
OFF	OFF	Database initialization
OFF	ON	Normal operation (factory setting)
ON	OFF	Software download
ON	ON	Configuration

2.6 Connecting MiRiCi-E3T3 to the SFP-CA Module

For first use, you have to assign an IP address to MiRiCi-E3T3 and specify a mode of operation. To do so, you can use RAD's SFP-CA module illustrated in [Figure 2-2](#). You can also use this module to upgrade MiRiCi-E3T3's software.

When you connect SFP-CA to a specific PC for the first time, you have to install the SFP-CA driver on that PC, and configure the PC network parameters for communication with SFP-CA. Refer to [Chapter 3](#) for details.

Note *All SFP-CA modules have the same MAC address (00-00-E8-00-00-01).*

➤ **To connect MiRiCi-E3T3 to the SFP-CA unit:**

1. Choose the desired operation mode using the DIP switches on MiRiCi-E3T3's underside as explained in [Required Equipment](#)
2. MiRiCi-E3T3 requires no special tools for installation.
3. Setting the Switches.
4. Connect the DC adapter to the SFP-CA configuration module and use the power cord to connect the DC adapter to the mains.
5. Plug the USB connector of SFP-CA into a free USB port of a PC.
6. Plug MiRiCi-E3T3 into the SFP socket on the opposite side on the SFP-CA unit.

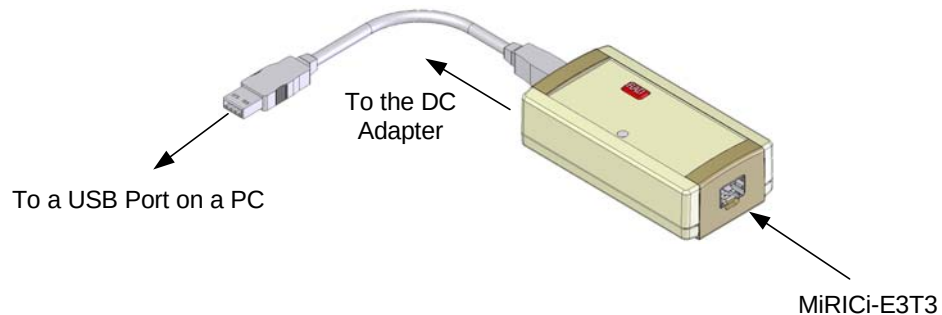


Figure 2-2. SFP-CA Configuration Module

2.7 Disconnecting MiRiCi-E3T3

Before physically disconnecting MiRiCi-E3T3, you have to first release the device using the Safely Remove Hardware utility.

➤ **To release MiRiCi-E3T3:**

1. Close all relevant management applications.
2. In the taskbar, double-click the Safely Remove Hardware icon.

The Safely Remove Hardware screen appears listing all USB devices currently connected to your PC.

3. Select **ADM8511 USB To Fast Ethernet Adapter** and click **Stop**.

A message appears confirming that you can safely remove the device.

Note *If you disconnect MiRiCi-E3T3 and/or the SFP CA module before releasing it, your PC may stop responding.*

➤ **To disconnect MiRiCi-E3T3 from the PC:**

1. Push the release button at the front of MiRiCi-E3T3, and then eject MiRiCi-E3T3 from SFP-CA.
2. Disconnect SFP-CA from the PC and from the power.

2.8 Inserting MiRiCi-E3T3 into a Host Unit

This chapter explains how to connect (eject) MiRiCi-E3T3 to (from) a host unit.

Note *You do not have to switch off the host unit when inserting or extracting MiRiCi-E3T3.*

➤ **To insert MiRiCi-E3T3:**

1. Set the DIP switches to the desired operation mode as specified in [Table 2-1](#).
2. Insert MiRiCi-E3T3 into a free SFP (MSA-compatible) socket of the host equipment.
3. Press MiRiCi-E3T3 firmly into the MSA SFP port connector.

MiRiCi-E3T3 is ready to operate.

➤ **To eject MiRiCi-E3T3:**

1. Disconnect cables attached to MiRiCi-E3T3.
2. Push the release button at the front of MiRiCi-E3T3. This extracts the device from the edge connector.
3. Remove MiRiCi-E3T3 from the socket.

2.9 Connecting MiRiCi-E3T3 to E3/T3 Equipment

MiRiCi-E3T3 can be connected to E3/T3 equipment.

➤ **To connect to E3/T3 equipment:**

- Use the miniature BNC cables (included in the MiRiCi-E3T3 package), to connect MiRiCi-E3T3 to the coaxial E3 or T3 lines.

Chapter 3

Operation

This chapter:

- Provides a detailed description of the MiRiCi-E3T3 LED indicators and their functions
- Lists alternative methods of the product configuration, explaining I²C and Web browser management applications and illustrating management menus.

For additional information on parameters and menus, refer to [Chapter 4](#).

3.1 Indicators

The front of MiRiCi-E3T3 has two status LEDs. Refer to [Table 3-1](#) for the functions of the LED indicators. The LEDs indicate link status and operation modes during normal operation as well as while powering up.

When MiRiCi-E3T3 is powered on, the LOS LED turns on for five seconds. For MiRiCi-E3T3/FE, the LINK LED also turns on for five seconds. During the first five seconds, MiRiCi-E3T3 is ready to respond to I²C messages without signal stretching. Then while MiRiCi-E3T3/FE boots up its application software and performs startup configuration, the LOS LED blinks three times (if MiRiCi-E3T3 mode is NORMAL or CONFIG).

Table 3-1. LED Indicators

LED	Function
MiRiCi-E3T3/FE: LINK (green)	ON – Ethernet link is connected OFF – Ethernet link is disconnected
MiRiCi-E3T3/GbE: LINK/ACT (green)	ON – Ethernet link is connected Blinking – Activity on Ethernet link OFF – Ethernet link is disconnected
LOS (red)	ON – No T3 signal detected OFF – Valid T3 signal detected
LOS at power-up	Blinking three times – MiRiCi-E3T3 is in NORMAL or CONFIG mode Continuously blinking – MiRiCi-E3T3 is in INIT DB mode OFF – MiRiCi-E3T3 is in SW DOWNLOAD mode

Note

Certain Ethernet equipment may cause the LINK or LINK/ACT LED to turn on before the T3 cable has been connected.

3.2 Configuration and Management Alternatives

If required, MiRiCi-E3T3 can be reconfigured, using the following ports and applications:

- Local out-of-band management via an I²C interface.
- Local or remote inband management via the Fast Ethernet port, using RAD's Web-based application.

In order to choose the Normal mode, you have to set DIP switches located on MiRiCi-E3T3's underside as listed in [Chapter 2](#). If configured locally, you have to insert MiRiCi-E3T3 into the associated SFP-CA module and connect it to your PC as explained in [Chapter 2](#).

Working with the I²C Interface

MiRiCi-E3T3 enables configuring and monitoring the current status and performing diagnostics via the SFP edge connector's I²C interface. Refer to [Appendix C](#) for instructions and the required message format.

Working with the Web-Based Management Interface

You can locally or remotely configure and manage MiRiCi-E3T3 using a Web-based management interface. [Chapter 4](#) illustrates menus and explains configuration parameters.

Requirements for Web Based Management

- Internet Explorer 6.0, running on Windows
- **Before you start using a Web browser for management or monitoring:**
- Enable scripts.
 - Configure the firewall that might be installed on your PC to allow access to the destination IP address.
 - Disable pop-up blocking software, such as Google Popup Blocker. You may also have to configure spyware and adware protecting software to accept traffic from/to the destination IP address.
 - To prevent configuration errors, you must flush the browser's cache whenever you return to the same screen.

Access Levels

To prevent unauthorized modification of the operating parameters, MiRiCi-E3T3 supports two access levels:

- Superuser (su) can perform all the activities supported by the MiRiCi-E3T3 management facility, including defining new users.
- User (user) has only read-only access rights.

➤ **To enter as a superuser:**

1. Enter **su** as the user name.
2. Enter **1234** as the password.

This allows you to configure all MiRiCi-E3T3 parameters.

➤ **To enter as a user:**

1. Enter **user** as the user name.
2. Enter **1234** as the password.

This allows you to view the MiRiCi-E3T3 parameters.

Configuring MiRiCi-E3T3 for First Use

Before using MiRiCi-E3T3 for the first time, you have to assign an IP address to it that complies with your network requirements. You can do this by connecting it to a PC via the SFP-CA adapter.

When you connect SFP-CA to a specific PC for the first time, you have to install the SFP-CA driver on that PC, and configure the PC network parameters for communication with SFP-CA.

➤ **To install the SFP-CA driver on a PC:**

1. Insert the Technical Documentation CD into the CD drive of the PC.

The CD main menu appears.

2. Click the link to the MiRiC/MiRiCi Family product page.

The MiRiC/MiRiCi Family product page appears, with an entry for the SFP-CA documentation and driver.

3. Double-click the SFP-CA driver link.

The SFP-CA driver is installed in the background. No further action is required to install the driver.

Note *The SFP-CA driver requires Windows XP SP2 to be installed on the relevant PC.*

-
- **To configure the PC network parameters for the SFP-CA connection to MiRiCi-E3T3:**
1. Connect the SFP-CA configuration unit to a USB port on your PC. For additional information, refer to [Chapter 2](#).
The New Hardware is Detected notice appears.
 2. Right-click **My Network Places**.
A new local area network connection appears in the list of network connections.
 3. Right-click the new local area connection and rename it **SFP-CA**.
 4. Right-click **Properties**, click **Configure**, and select the **Advanced** tab
The Network Connection Properties dialog box appears.
 5. Choose **Select Media** and under **Value**, choose **Home LAN**, and then click **OK**.
The dialog box closes and your settings are applied.
 6. Right-click the **SFP-CA** connection and click **Properties**.
The Local Area Connection Properties dialog box appears.
 7. Select **Internet Protocol (TCP/IP)** and click **Properties**.
The Internet Protocol (TCP/IP) dialog box appears.
 8. To enable entering TCP/IP settings, select **Use the following IP Address**.
The IP Address, the Subnet Mask and the Default Gateway field become available.
 9. Enter the following TCP/IP settings and then click **OK**:
 - **IP Address:** 192.168.205.20
 - **Subnet Mask:** 255.255.255.0
 - **Default Gateway:** 192.168.205.1
 10. Close **My Network Places**.
The PC communication link with MiRiCi-E3T3 is ready.

➤ **To assign a new IP address to MiRiCi-E3T3:**

1. Set MiRiCi-E3T3 to Configuration mode, using its DIP switches (see [Chapter 2](#)).

Note *Setting a different working mode via the DIP switches requires disconnecting MiRiCi-E3T3 from any device (SFP-CA or host).*

2. Plug MiRiCi-E3T3 into the SFP socket of the SFP-CA module.
3. Connect SFP-CA to your PC via USB 2.0 port.
The Ready LED on SFP-CA turns on.

-
4. Open the Web browser and enter **http://192.168.205.1** into the Web browser's address field.

The Opening screen appears.

5. Click **Login**.

The Login screen appears.

6. Enter the default user name **su** and the default password **1234** for Superuser access, and then click **Submit**.

A menu appears to the left and you are able to configure MiRiCi-E3T3.

7. From the Host IP menu (Configuration > System > Management > **Host IP**), enter the new IP address, the IP mask, and the default gateway values.

8. Save the changes.

The new TCP/IP settings are assigned. You may continue specifying additional parameters or connect to MiRiCi-E3T3 from any PC on your network at a later stage, using the newly assigned IP address.

Note *In Configuration mode, MiRiCi-E3T3 responds to the default IP address 192.168.205.1 only, even if the IP address has been changed.*

Navigating the Web-Based Management Menus

The MiRiCi-E3T3 Web-based remote access management software provides a user-friendly interface for configuring, collecting statistics and performing diagnostic tests on the MiRiCi-E3T3 units.

► To choose an option:

1. Click a link in the screen to display the next menu.
2. Once the target screen is displayed, select a value from the dropdown list or enter it in a text box.

Menu Map

Use these menu trees as a reference aid while performing configuration and control functions. [Chapter 4](#) illustrates menus and explains parameters.

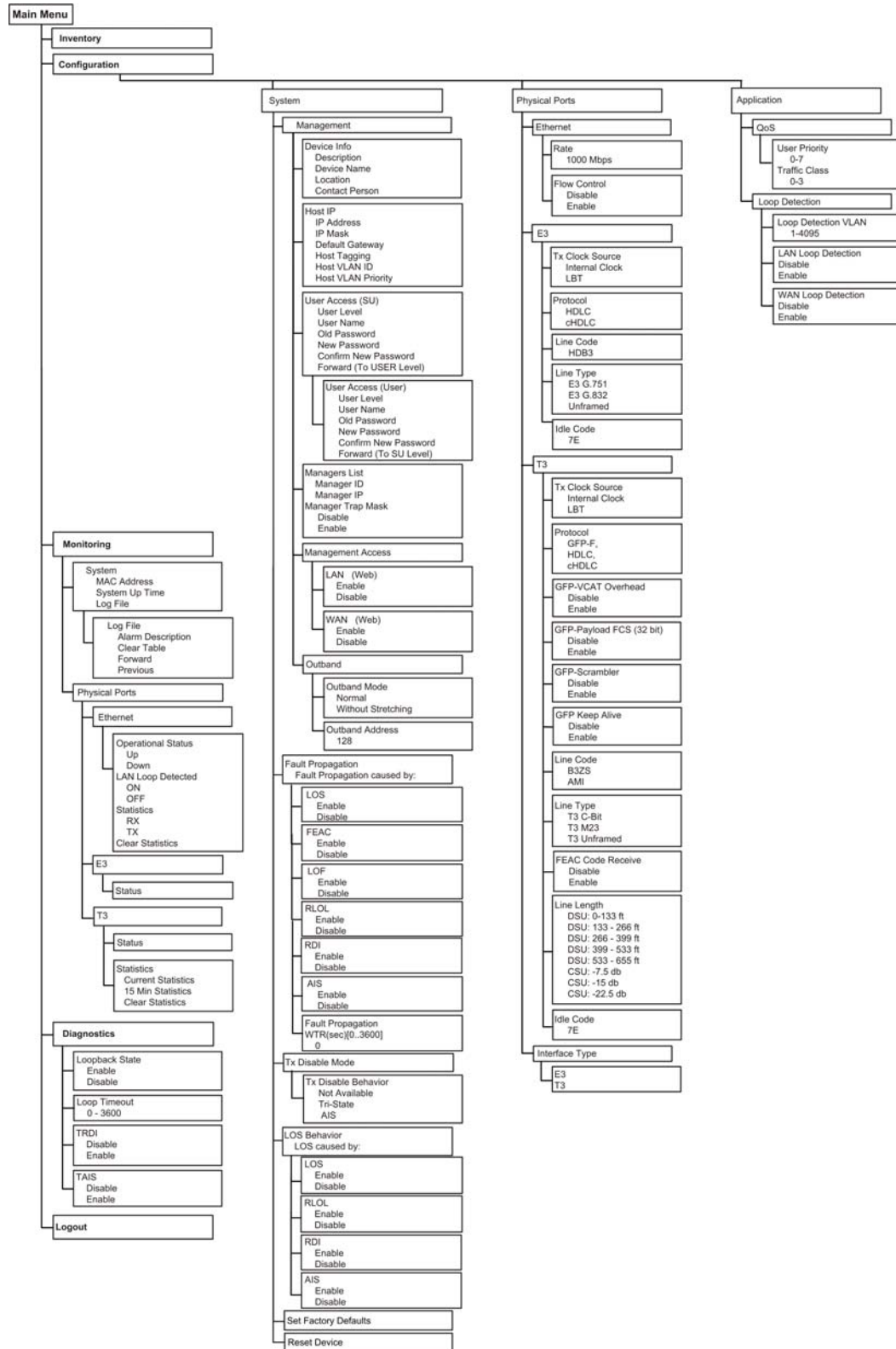


Figure 3-1 E3/T3 Menu Map

Chapter 4

Configuration

This chapter illustrates the configuration MiRiCi-E3T3 screens and explains their parameters.

The menu map of the MiRiCi-E3T3 management software can be found in [Chapter 3](#).

4.1 Configuring for Management

Before configuring MiRiCi-E3T3 make sure to assign a new IP address, an IP mask and a default gateway values to the unit's host, as explained in [Chapter 3](#). Once the MiRiCi-E3T3 host IP parameters are set, perform the following steps in order to configure MiRiCi-E3T3 for management:

Configuring the Host IP Parameters

In addition to defining the IP parameters of the MiRiCi-E3T3 host (see [Chapter 3](#)), the management software allows you to create a dedicated management VLAN in order to separate management traffic from the user data.

► To configure the host IP parameters:

1. Navigate to the Host IP menu (Configuration > System > Management > Host IP).

The Host IP menu appears.

MiRiCi-E3T3

[Configuration](#) > [System](#) > [Management](#) > [Host IP](#)

IP Address		192.168.205.1
IP Mask		255.255.255.0
Default Gateway		0.0.0.0
Host Tagging		Untagged

Figure 4-1. Host IP Menu

2. From the Host IP menu (Configuration > System > Management > Host IP), do the following:
 - In the **IP Address** field, enter the host IP address
 - In the **IP Mask** field, enter the host IP mask.
 - In the **Default Gateway** field, set the default gateway IP address.
 - Set **Host tagging** to be **Tagged** or **Untagged** to consider or ignore the VLAN tagging of the management traffic coming from the management station.
 - If host tagging is enabled, two additional parameters appear:
 - **Host VLAN ID** (ID of the host VLAN): **1-4094**
 - **Host VLAN Priority** (Priority of the host VLAN): **0-7**

Note Before setting Host Tagging to **Tagged**, make sure that your PC is connected to the VLAN or that another PC connected to the VLAN is available to continue setting parameters.

Entering Device Information

The MiRiCi-E3T3 management software allows you to assign a name to the unit, add its description, specify its location to distinguish it from the other devices installed in your system, and assign a contact person.

➤ **To enter device information:**

1. Navigate to the Device Info menu (Configuration > System > Management > Device Info).

The Device Info menu appears.

MiRiCi-E3T3

Configuration > System > Management > Device Info

Description		T3 Intelligent Converter
Device Name		MiRiCi-E3T3
Location		
Contact Person		

Figure 4-2. Device Info Menu

2. Select **Device Name** and enter a desired name for the MiRiCi-E3T3 unit. The default reflects the unit and the physical port type that you specified last, for example **MiRiCi-E3**.
3. In the **Device Location** field, enter the desired name for the current MiRiCi-E3T3 location.
4. In the **Contact Person** field, enter the name of a contact person.

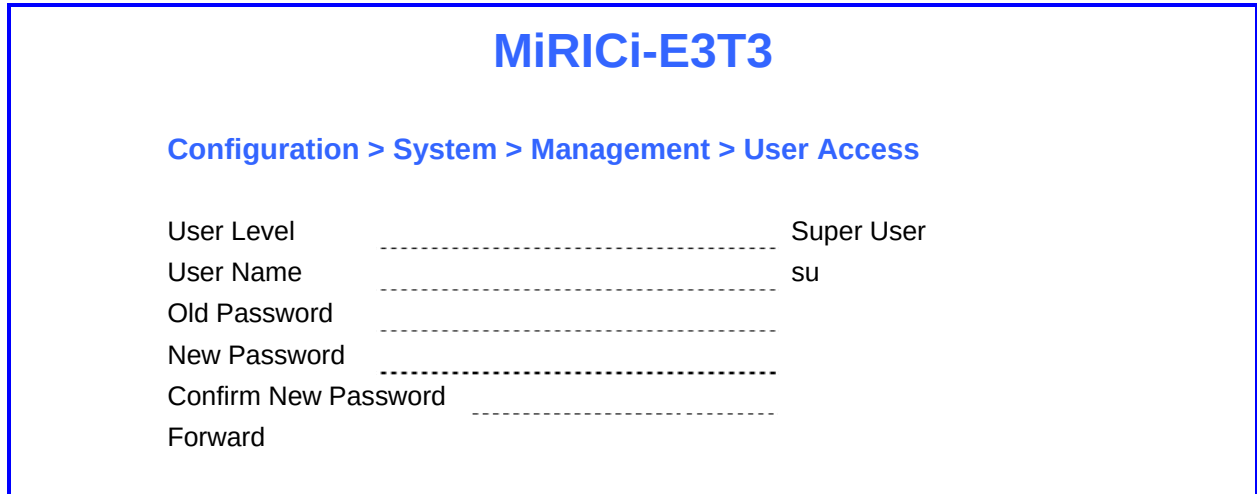
Defining Management Access Permissions

MiRiCi-E3T3 management software allows the super user (su) to modify the super user and guest user credentials.

➤ **To change the user name and/or the password:**

1. Make sure that you are logged in as **su**.
2. Navigate to the User Access menu (Configuration > System > Management > User Access).

The User Access menu appears.



MiRiCi-E3T3

Configuration > System > Management > User Access

User Level	-----	Super User
User Name	-----	su
Old Password	-----	
New Password	-----	
Confirm New Password	-----	
Forward		

Figure 4-3. User Access Menu

3. From the User Access menu, do the following:
 - Click **Forward** to select the desired user: **Super User** or **User**.
 - In the **User Name** field, assign a new user name.
 - In the **Old Password** field, enter the super user password used to log in during the current management session.
 - In the **New Password** field, assign a new password.
 - In the **Confirm New Password** field, re-enter the new password to confirm it.
4. Click **Save**.

Note *Make sure not to assign the same user name to the super user and the guest user.*

Configuring the Manager List

You define the managers and specify which manager(s) will receive SNMP traps. Up to eight managers can be defined. Entering the IP address and corresponding subnet mask identifies each management station. In addition, you can

temporarily prevent a manager station from receiving traps, by masking the network manager.

► **To define new managers:**

1. Navigate to the Management Access menu (Configuration > System > Management > Managers List).

The Managers List menu appears.

MiRiCi-E3T3		
Configuration > System > Management > Managers List		
Manager ID	Manager IP	Manager Trap Mask
1	0.0.0.0	Disable
2	0.0.0.0	Disable
3	0.0.0.0	Disable
4	0.0.0.0	Disable
5	0.0.0.0	Disable
6	0.0.0.0	Disable
7	0.0.0.0	Disable
8	0.0.0.0	Disable

Figure 4-4. Managers List menu

2. In the Manager IP field, specify an IP address for the new manager.
3. In the Manager Trap Mask field, specify **Disable** or **Enable** to mask or unmask traps for the new management station.
4. Select **Save**.
5. Repeat the previous four steps for each network manager you wish to add.

Controlling Management Access

You can enable or disable Web access to MiRiCi-E3T3 via WAN or LAN.

► **To enable or disable Web access to MiRiCi-E3T3:**

1. Navigate to the Management Access menu (Configuration > System > Management > Management Access).

The Management Access menu appears.



MiRiCi-E3T3

Configuration > System > Management > Management Access

LAN (Web)	-----	Enable
WAN (Web)	-----	Enable

Figure 4-5. Management Access Menu

2. From the Management Access menu, perform the following:
 - Enable or disable Web access to MiRiCi-E3T3 via its LAN interface
 - Enable or disable Web access to MiRiCi-E3T3 via its WAN interface.
3. Click **Save**.

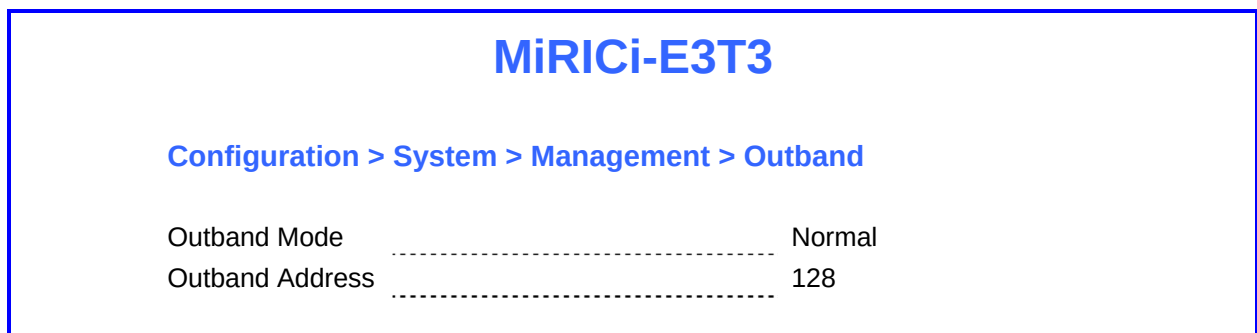
Enabling/Disabling I²C Cycle Stretching

MiRiCi-E3T3 can be configured to operate with or without the I²C cycle stretching functionality. Refer to [Appendix C](#) for additional information.

► **To enable or disable I²C Cycle Stretching:**

1. Navigate to the Outband menu (Configuration > System > Management > Outband).

The Outband menu appears.



MiRiCi-E3T3

Configuration > System > Management > Outband

Outband Mode	-----	Normal
Outband Address	-----	128

Figure 4-6. Outband Menu

2. To enable I²C Cycle Stretching, select **Normal**.

3. To disable I²C Cycle Stretching, select **Without Stretching**.
4. Click **Save**.

4.2 Configuring for Operation

The recommended configuration procedure for MiRiCi-E3T3 includes the following:

- Configuring system-level parameters
- Configuring Ethernet and E3/T3 interfaces at the physical level.

Configuring the System-Level Parameters

The system-level parameters of MiRiCi-E3T3 include the following:

- Fault propagation
- LOS behavior
- Tx disable mode.

These parameters are configured via the System menu.

Configuring Fault Propagation

Fault propagation mechanism propagates the E3/T3 LOS signal to the 10/100BaseFx port. When the fault propagation is enabled, the Ethernet port is disconnected if one of the following events is detected on the TDM interface:

- Loss of signal (LOS)
- Loss of frame (LOF)
- Far-end alarm and control (FEAC)
- Receive loss of lock (RLOL)
- Remote defect indication (RDI)
- Alarm indication SIGNAL (AIS)

Alternatively, you can disable propagation of any of the supported conditions to the Ethernet port.

You can also specify the wait-to-restore (WTR) time. WTR refers to the time period that MiRiCi-E3T3 waits before reconnecting an interface once the failed interface has been restored.

► **To configure the fault propagation:**

1. Navigate to the System menu (Configuration > System).

The System menu appears.

2. Enable or disable **Fault Propagation** respectively.
3. When enabled, select **Fault Propagation** to display the relevant menu and configure the following parameters:
 - **LOS:**
 - Enable (LOS on the TDM link is propagated to the Ethernet interface)
 - Disable (LOS on the TDM link is not propagated to the Ethernet interface)
 - **FEAC:**
 - Enable (FEAC on the TDM link is propagated to the Ethernet interface)
 - Disable (FEAC on the TDM link is not propagated to the Ethernet interface)
 - **LOF:**
 - Enable (LOF on the TDM link is propagated to the Ethernet interface)
 - Disable (LOF on the TDM link is not propagated to the Ethernet interface)
 - **RLOL:**
 - Enable (RLOL on the TDM link is propagated to the Ethernet interface)
 - Disable (RLOL on the TDM link is not propagated to the Ethernet interface)
 - **RDI:**
 - Enable (RDI on the TDM link is propagated to the Ethernet interface)
 - Disable (RDI on the TDM link is not propagated to the Ethernet interface)
 - **AIS:**
 - Enable (AIS on the TDM link is propagated to the Ethernet interface)
 - Disable (AIS on the TDM link is not propagated to the Ethernet interface)
 - **Fault Propagation WTR (Wait-to-restore in seconds):** 0-3600; 0 disables the WTR.

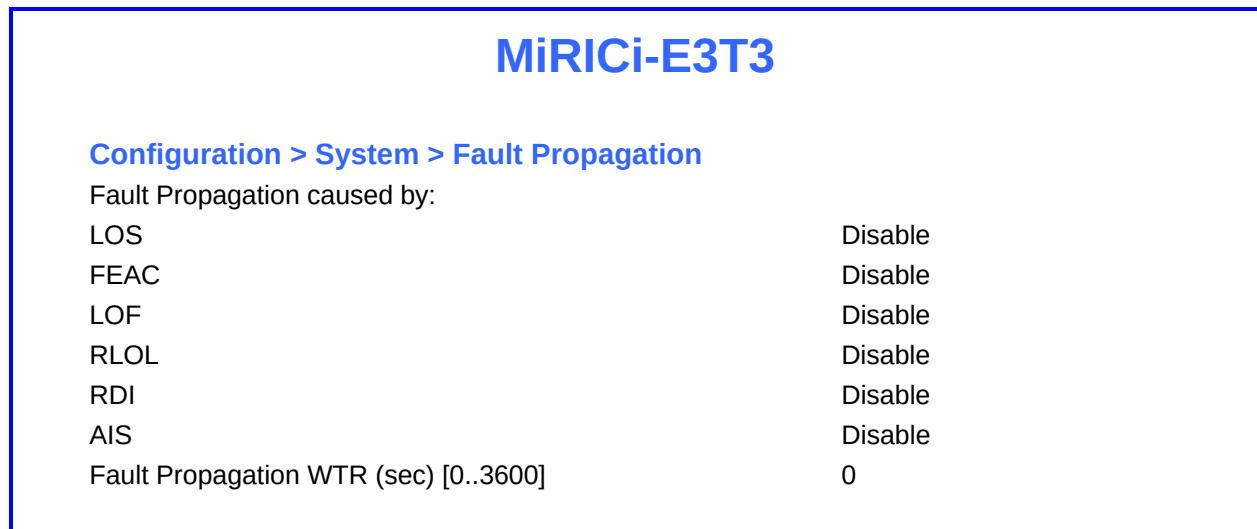


Figure 4-7. Fault Propagation Menu

Configuring Tx Disable Mode

MiRiCi-E3T3 lets you configure how the system responds to disabling the Tx connection.

► To configure the Tx Disable Mode

1. In the System menu (Configuration > System), click **Tx Disable Mode**.

The Tx Disable Mode screen appears.



Figure 4-8. Tx Disable Mode Screen

2. To specify how the system is to respond when the Tx link fails:
 - **Not Available.** The Tx link failure has no impact on MiRiCi-E3T3 and no action is taken.
 - **Tri-State.** The E3/T3 framer is shut down.
 - **AIS.** The Alarm Indication signal is activated.

Configuring LOS Behavior

MiRiCi-E3T3 allows you to define whether to send the LOS indication to the Ethernet interface when one of the following conditions is detected on the TDM link:

- Loss of signal (LOS)
- Receive loss of lock (RLOL)

- Remote defect indication (RDI)
- Alarm indication signal (AIS)

➤ **To configure the LOS behavior:**

1. In the System menu (Configuration > System), click **LOS Behavior**.

The LOS Behavior menu appears, allowing you to enable or disable the LOS behavior, depending on its cause.

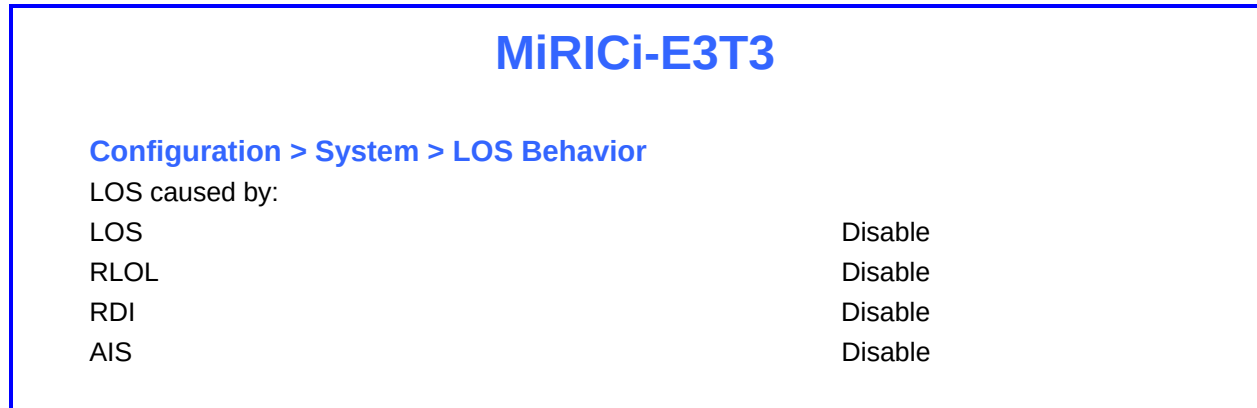


Figure 4-9. LOS Behavior Screen

2. Specify MiRiCi-E3T3's LOS behavior.
 - LOS:
 - Enable (LOS on the TDM link is propagated to the Ethernet interface)
 - Disable (LOS on the TDM link is not propagated to the Ethernet interface)
 - RLOL:
 - Enable (RLOL on the TDM link is propagated to the Ethernet interface)
 - Disable (RLOL on the TDM link is not propagated to the Ethernet interface)
 - RDI:
 - Enable (RDI on the TDM link is propagated to the Ethernet interface)
 - Disable (RDI on the TDM link is not propagated to the Ethernet interface)
 - AIS:
 - Enable (AIS on the TDM link is propagated to the Ethernet interface)
 - Disable (AIS on the TDM link is not propagated to the Ethernet interface)

Configuring MiRiCi-E3T3 at the Physical Level

MiRiCi-E3T3 allows you to configure for transmission over E3 or T3. You can configure the Ethernet, E3, and T3 ports on the physical level.

Specifying the Interface Type

MiRiCi-E3T3 can operate in both E3 and T3 environments without the need for two different units.

► To specify the interface type:

1. Navigate to the Physical Ports menu (Configuration > Physical Ports).

The Physical Ports menu appears.



Figure 4-10. Interface Type Menu – Unit Currently in T3 Mode

2. Under **Interface Type**, select the desired interface type, **T3** or **E3** respectively.
3. Click **Save**.

The selected interface type appears and you are able to access the associated parameters. The system reverts to the Main menu.

Configuring the Ethernet Port

This section instructs you on configuring the Ethernet port.

➤ **To configure the Ethernet port:**

1. Navigate to the Ethernet menu (Configuration > Physical Ports > Ethernet).

The Ethernet menu appears.



Figure 4-11. Ethernet Menu

2. Under **Flow Control**, choose **Enable** if the receiving device is sending a Pause frame. This is necessary when the transmitting device transmits faster than the receiving device can receive.
3. Click **Save**.

Note Possible rates are 100 or 1000 Mbps, depending on whether you are using a Fast Ethernet (FE) or a Gigabit Ethernet (GbE) interface.

Configuring the E3 Port

This section instructs you on configuring the E3 interface.

➤ **To configure the E3 port:**

1. Navigate to the E3 menu (Configuration > Physical Ports > E3).

The E3 menu appears.

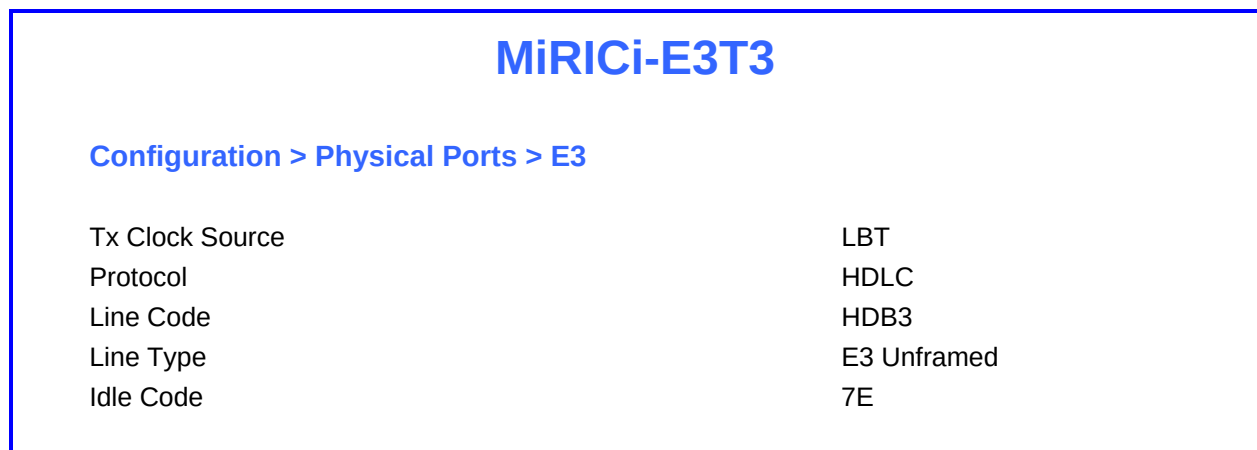


Figure 4-12. E3 Menu

2. From the E3 menu, select the desired parameters as follows:
 - **Tx Clock Source.** Choose the clock source of the Tx line.
 - **Internal Clock.** Select this option to choose the internal oscillator source.
 - **LBT.** Link to the loopback timing.
 - **Protocol.** You may choose a protocol according to the following MiRiCi-E3T3 definitions:
 - E3 Framed mode (G.751) - **HDLC** or **cHDLC (High Level Data Link Control)**.
 - E3 Framed mode (G.832) - **GFP** only.
 - E3 Unframed mode - **HDLC** or **cHDLC (High Level Data Link Control)**.
 - **Line Code.** **HDB3** is the line code available at present.
 - **Line Type.** **E3 G.751**, **E3 G.832** or **Unframed** are the line types available at present.
 - **Idle Code.** Fixed to **7E**.
3. Click **Save**.

Configuring the T3 Port

This section instructs you on configuring the T3 interface.

► To configure the T3 port:

1. Navigate to the T3 menu (Configuration > Physical Ports > T3).
The T3 menu appears.

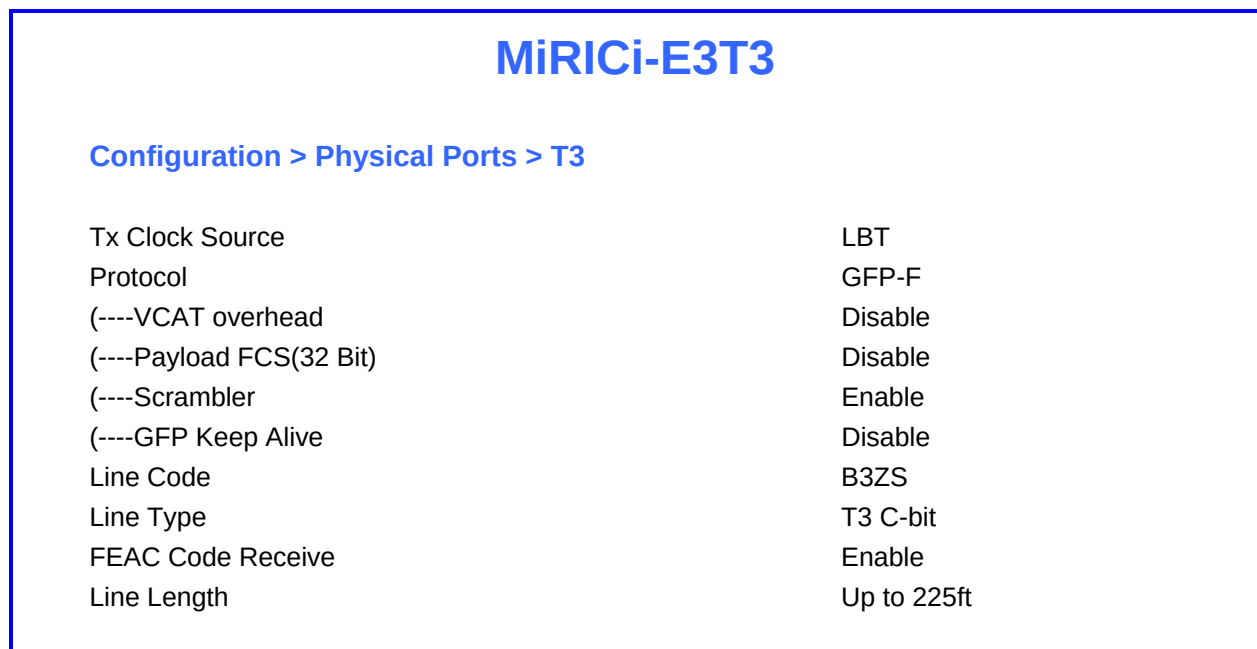


Figure 4-13. T3 Menu

2. From the T3 menu, select the desired parameters as follows:

- **Tx Clock Source.** Choose the clock source of the Tx line.
 - **Internal Clock.** Select this option to choose the internal oscillator source.
 - **LBT.** Link to the loopback timing.
 - **Protocol.** You may choose a protocol according to the following MiRiCi-E3T3 definitions:
 - T3 Framed mode – **GFP, HDLC or cHDLC (High Level Data Link Control).**
 - T3 Unframed mode - **HDLC or cHDLC (High Level Data Link Control)**
 - **VCAT Overhead.** If enabled, VCAT header is added to frames (only in GFP mode).
 - **Payload FCS (32 Bit).** If enabled, a frame check sequence field is carried by every frame as a payload for error detection (only in GFP mode).
 - **Scrambler.** If enabled and supported on both ends, information such as emails or voice gets truncated until it arrives at its destination (only in GFP mode).
 - **GFP Keep Alive.** If enabled, MiRiCi-E3T3 sends 2-3 keep alive messages per second. You should enable this parameter if MiRiCi-E3T3 is used with old equipment and LOFs are frequently encountered (only in GFP mode).
 - **Line Code.** You may choose either **B3ZS** or **AMI**.
 - **B3ZS.** A T-carrier line code, referred to as **bipolar with three-zero substitution**, in which bipolar violations are deliberately inserted if the stream of user data contains a string of 3 or more consecutive zeros.
 - **AMI.** Referred to as Alternate Mark Inversion because a **1** is referred to as a mark and a **0** as a space.
 - **Line Type.** **T3 C-bit , T3 M23 or T3 Unframed** (only in cHDLC or HDLC mode) are the line types available at present.
 - **FEAC Code Receive.** If enabled, FEAC bit codes for “Loop up” and “Loop down” commands are processed, otherwise they are ignored.
 - **Line Length.** This parameter refers to Line Build Out.
 - **Up to 225 ft.** The transmitted signal complies with the pulse mask standard (G.703) for a cable length of up to 225 ft.
 - **225 ft to 900 ft.** The transmitted signal complies with the pulse mask standard (G.703) for a cable length between 225 ft and 450 ft.
 - **Idle Code.** Fixed to **7E** (only in HDLC or cHDLC mode)
3. Click **Save**.

Configuring MiRiCi-E3T3 at the Application Level

Configuring Quality of Service (QoS)

MiRiCi-E3T3 supports Quality of Service (QoS) with classification according to VLAN priority (802.1p). Classification results are mapped into four transmit priority queues with strict priority

► **To assign priorities to traffic queues:**

1. Navigate to Main Menu > Configuration > Applications > **QoS**.

The QoS Mapping menu appears.

MiRiCi-E3T3	
Configuration > Applications > QoS	
User Priority 0	Traffic Class 0
User Priority 1	Traffic Class 0
User Priority 2	Traffic Class 0
User Priority 3	Traffic Class 0
User Priority 4	Traffic Class 0
User Priority 5	Traffic Class 0
User Priority 6	Traffic Class 0
User Priority 7	Traffic Class 0

Table 4-1 QoS Mapping Menu

2. From the QoS Mapping menu, choose the desired priority (0 – 7) and select the assigned traffic queue number (0 – 3). Each traffic queue can be assigned to more than one priority.

These are priority queues, i.e. packets arriving with lower priority will only be transmitted after all packets with higher priority have been transmitted. It implies possible starvation of lower priority traffic in case higher priority traffic uses all available bandwidth.

Note *Class 0 (the default one) has lowest priority, 3 highest.*

3. Repeat steps 1 – 3 for all priorities.
4. Select **Save**.

Configuring Loop Detection

MiRiCi-E3T3 features a mechanism to detect loops on the LAN side or WAN side by transmitting special loop detection frames.

➤ To configure loop detection:

1. Navigate to Main Menu > Configuration > Applications > **Loop detection**.

The Loop Detection menu appears.

MiRiCi-E3T3	
Configuration > Applications > Loop Detection	
Loop Detection VLAN [1..4095]	1
LAN Loop Detection	Disable
WAN Loop Detection	Disable

Table 4-2 Loop Detection Menu

2. From the Loop Detection menu, select the desired parameters as follows:

- **Loop Detection VLAN.** Choose the VLAN identification number of the loop detection frame (1..4095).
- **LAN Loop Detection.** If enabled the loop detection mechanism is activated for the LAN side
- **WAN Loop Detection.** If enabled the loop detection mechanism is activated for the WAN side

Note *Data is normally sent to and from the MiRiCi-E3T3 via the LAN/WAN. Once loop detection is enabled, the unit starts transmitting special loop detection frames. If the unit recognizes that a loop exists, the following actions are performed according to the direction/location of the loop:*

- *If a loop exists on the LAN side the unit sends a loop detection alarm accordingly.*
- *If a loop exists on the WAN side the unit stops the traffic to the WAN side and then sends a loop detection alarm accordingly.*

3. Select **Save**.

4.3 Additional Tasks

This section describes additional operations available supported by the MiRiCi-E3T3 management software, including the following:

- Displaying inventory
- Displaying the MiRiCi-E3T3 status information at the system and physical levels
- Restoring defaults
- Resetting the unit
- Setting options for testing the system during runtime.

Displaying the MiRiCi-E3T3 Inventory

The MiRiCi-E3T3 inventory displays description of the unit, its hardware, firmware and software revisions, serial number etc.

- To display the MiRiCi-E3T3 inventory:
- From the Main menu, select **Inventory**.

The Inventory menu appears.

MiRiCi-E3T3											
Inventory											
ID	Description	Vendor Type	Class	Entity Name	HWRev	FWRev	SWRev	Serial No	Alias	Asset ID	FRU
1	MiRiCi-T3-Chassis	0	3	MiRiCi-T3-Chassis	0.0	0.0	2.0E01	1.00		0	True

Figure 4-14. Inventory Screen

Displaying the MiRiCi-E3T3 Status

The MiRiCi-E3T3 software provides access to the following status information:

- System level – MAC address and system uptime period
- Physical ports – status of the physical layer alarms and errors.

Displaying System Status Information

The System menu includes the following:

- MAC address of the MiRiCi-E3T3 unit
- MiRiCi-E3T3 uptime (time elapsed since the last reset in hh:mm:ss format).

➤ To display the system status information:

- From the Monitoring menu, select **System**.

The system (MAC) address and the time that the system runs since the last reset (system up time) appear as illustrated in *Figure 4-15*.

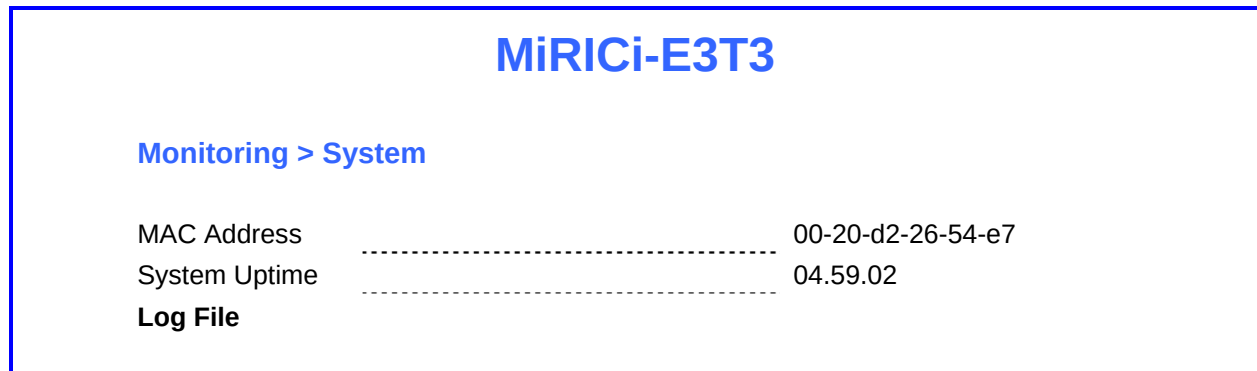


Figure 4-15. System Status Screen

You can select **Log File** to display the logged events for the system level (see *Chapter 6*).

Displaying the Physical Layer Status

You can view the status of LAN and TDM connections at the physical level.

Viewing the Ethernet Port Status

➤ To display the Ethernet physical layer status:

- Navigate to the Physical Ports Ethernet Status menu (**Monitoring > Physical Ports > Ethernet**).

The Physical Ports Ethernet Status menu appears.

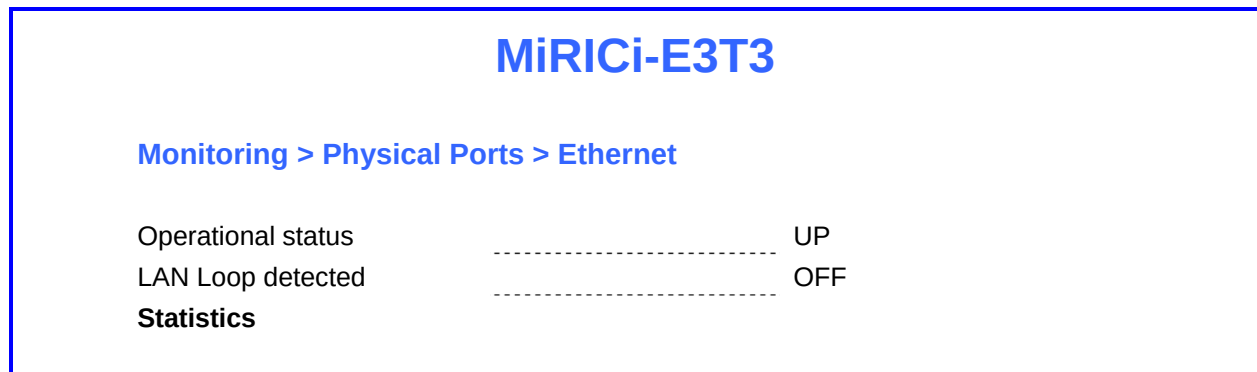


Figure 4-16 Ethernet Port Status Menu

You can change the direction of the operational status by selecting **UP** or **DOWN** from the Ethernet Port Status menu (see *Figure 4-16*). **LAN Loop detected**—Loop detected (ON), Loop not detected or loop detection not activated (OFF)

You can select **Statistics** to display the logged statistical counters for the Ethernet physical layer (see *Chapter 6*)

Viewing the E3/T3 Port Status

- To display the E3/T3 physical layer status:
 - Navigate to the Physical Ports E3/T3 Status menu (**Monitoring > Physical Ports > E3/T3**).

The Physical Ports E3/T3 Status menu appears.



Figure 4-17 Physical Ports E3/T3 Status Menu

- To display the E3/T3 physical layer status information:
 - From the Physical Ports E3/T3 Status menu, select **Status**

The Physical Ports E3/T3 Status menu appears.

The Physical Ports E3/T3 Status menu includes information on the status of the physical layer errors.

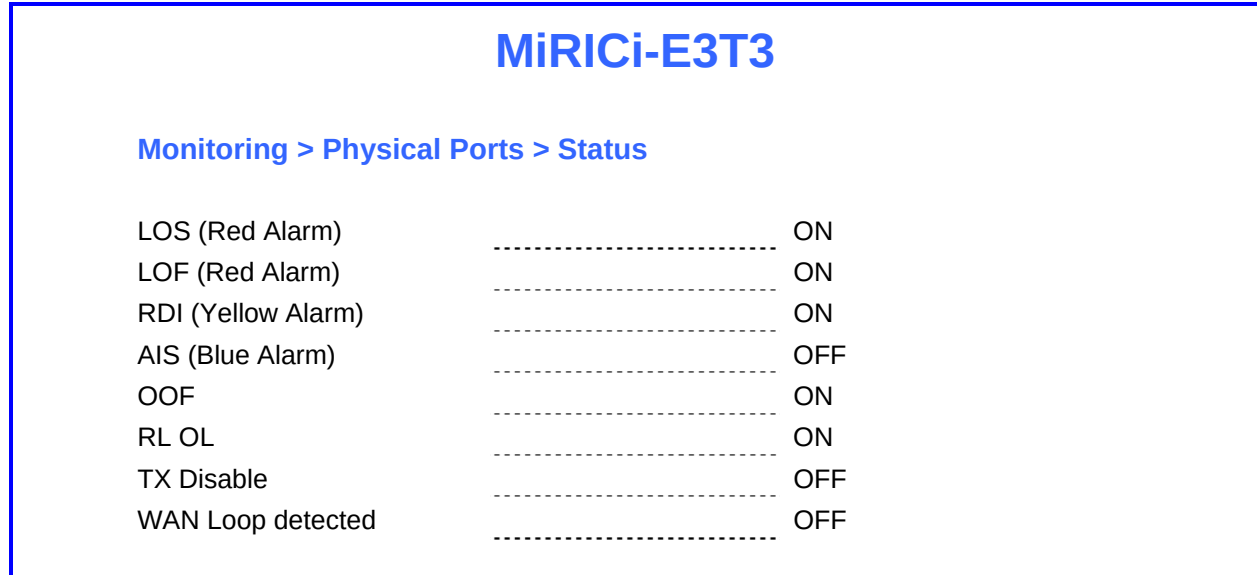


Figure 4-18. Physical Ports T3 Status Menu

Table 4-3. Status Indicators

Parameter	Description
LOS	Loss of Signal encountered (ON), resolved (OFF)
LOF	Loss of Frame (ON), resolved (OFF)
RDI	Remote Alarm Indication (ON), resolved (OFF)
AIS	Alarm Indication Signal (ON), resolved (OFF)
OOF	Out of Frame (ON), resolved (OFF)
RL OL	LIU Out of Lock (ON)
TX Disable	Tx connection disabled (ON), enabled (OFF)
Wan Loop detected	Loop detected (ON), Loop not detected or loop detection not activated (OFF)

You can select **Statistics** to display the logged statistical counters for the E3/T3 physical layer (Refer to Troubleshooting and Diagnostics).

Restoring Defaults

You can restore the MiRiCi-E3T3 default settings.

- **To restore the MiRiCi-E3T3 default settings:**
 1. From the System menu (Configuration > System), select **Set Factory Defaults**.
You are asked to confirm your request.
 2. Click **Yes** to confirm your request.
MiRiCi-E3T3 is reset and all settings are reset to the factory default.

Resetting MiRiCi-E3T3

You can perform an overall reset of MiRiCi-E3T3.

- **To reset MiRiCi-E3T3:**
 1. In the System menu (Configuration > System), select **Reset Device**.
You are asked to confirm your request.
 2. Click **Yes** to confirm your request.
MiRiCi-E3T3 is reset and all parameters configured before saving them last are preserved.

Chapter 5

Configuring Typical Applications

This chapter provides detailed instructions for configuring MiRiCi-E3T3 for a typical application.

Figure 5-1 illustrates a typical application where MiRiCi-E3T3 provides transparent LAN services over leased lines to connect branches to the headquarters over the E3/T3 infrastructure. The illustrated application illustrates MiRiCi-E3T3 units working opposite other MiRiCi-E3T3 units.

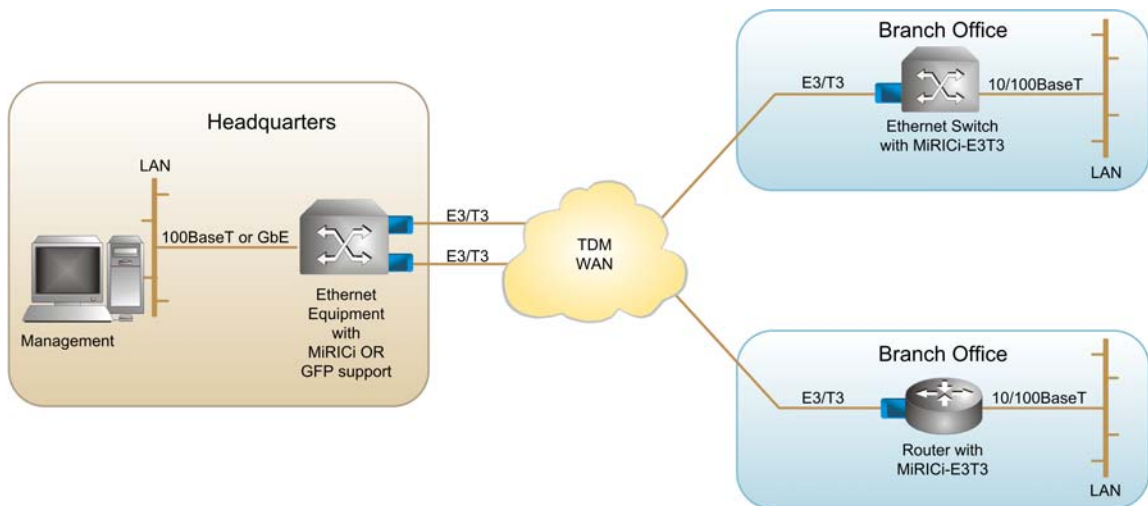


Figure 5-1. Typical MiRiCi-E3T3 Application

You have to configure the following for each MiRiCi-E3T3 unit (in any suitable order):

- Host IP parameters
- Ethernet port
- E3/T3 ports.

5.1 Configuring MiRiCi-E3T3

MiRiCi-E3T3, connected to host devices such as routers or switches, forwards Fast Ethernet or Gigabit Ethernet LAN packets to TDM-based WAN at full duplex wire speed over E3 or T3 lines. Every MiRiCi-E3T3 unit must be configured separately.

Configuring the Host IP Parameters

The IP address serves as a destination for the management traffic. The default IP address is 192.168.205.1. You have to assign a new IP address that is suitable for your application.

- To configure the host IP parameters:
 1. In the IP address field of the Host IP menu (Configuration > System > Management), assign new IP addresses **10.10.10.1**, **10.10.10.2**, etc. to each MiRiCi-E3T3 unit.
 2. Assign the new IP mask **255.255.255.0** to all MiRiCi-E3T3 units. All MiRiCi-E3T3 units and the management station must belong to the same subnet.
 3. Leave the remaining parameters unchanged.

MiRiCi-E3T3

Configuration > System > Management > E3 > Host IP

IP Address		10.10.10.1
IP Mask		255.255.255.0
Default Gateway		0.0.0.0
Host Tagging		Untagged

Figure 5-2. Host IP Menu (First MiRiCi-E3T3 Unit)

Controlling Management Access

You can enable or disable Web access to MiRiCi-E3T3 via WAN or LAN.

- To enable or disable Web access to MiRiCi-E3T3:
 1. Navigate to the Management Access menu (Configuration > System > Management > Management Access).
The Management Access menu appears.
 2. Enable **Web Access** via both the LAN and the WAN interfaces.
 3. Click **Save**.

Configuring the Ethernet Port

If the transmitting device transmits faster than the receiving device can receive, you have to enable flow control, allowing MiRiCi-E3T3 to send a pause frame when necessary.

➤ **To enable Flow Control:**

- In the Flow Control field of the Ethernet menu (Configuration > Physical Ports > Ethernet), select **Enable**.



Figure 5-3. Ethernet Menu

Configuring the E3/T3 Port

You have to configure the T3 interface as follows.

➤ **To choose the interface type T3:**

1. Navigate to the Physical Ports menu (Configuration > Physical Ports).

The Physical Ports menu appears.



Figure 5-4. Physical Ports Menu – Unit Currently in E3 Mode

2. Under **Interface Type**, select **T3**.
3. Click **Save**.

The unit is set to the selected interface type and the system reverts to the Main menu.

➤ To configure the T3 port:

1. Navigate to the T3 menu (Configuration > Physical Ports > T3).

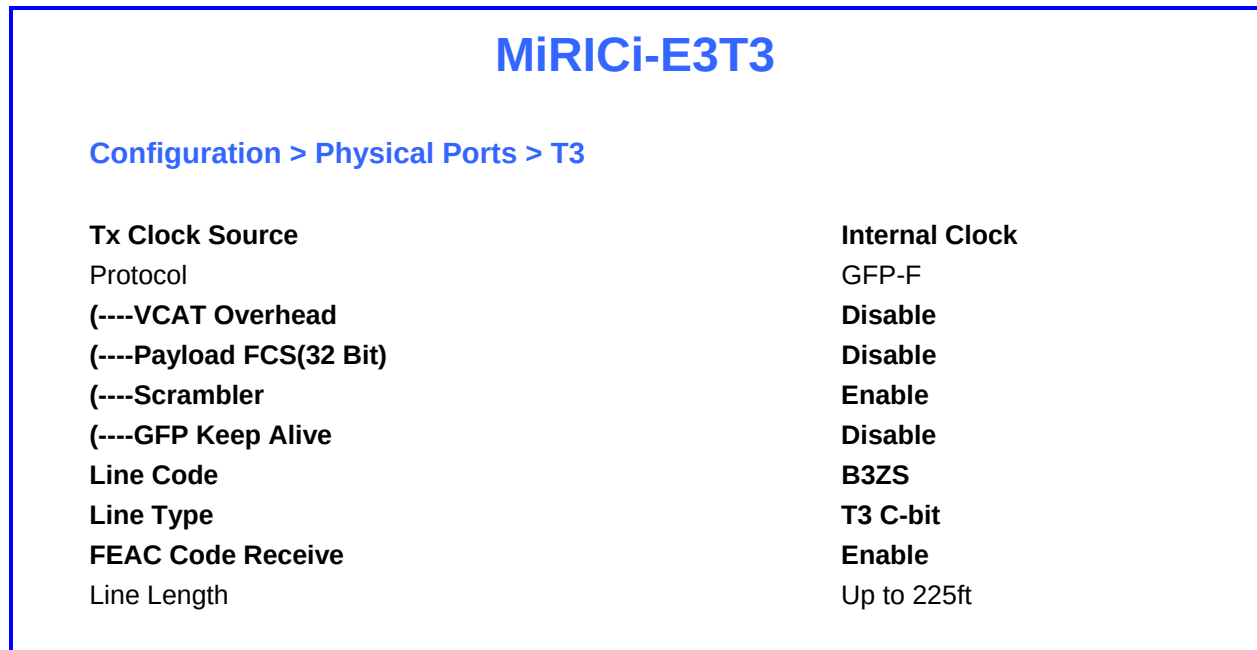


Figure 5-5. T3 Menu

2. From the T3 menu, select the desired parameters as follows:
 - **Tx Clock Source.** Select **Internal Clock**.
 - **Protocol.** Choose a protocol according to the following MiRiCi-E3T3 definitions:
 - T3 Framed mode – **GFP, HDLC or cHDLC (High Level Data Link Control)**.
 - T3 Unframed mode - **HDLC or cHDLC (High Level Data Link Control)**
 - **VCAT Overhead.** Disable this parameter
 - **Payload FCS (32 Bit).** Disable this parameter.
 - **Scrambler.** If supported on both ends, enable **Scrambling** to truncate the content of emails or voice messages until they arrive at its destination.
 - **GFP Keep Alive.** Disable this parameter
 - **Line Code.** Select **B3ZS**.
 - **Line Type.** Select **T3 C-bit**.
 - **FEAC Code Receiver.** Enabling this parameter ensures that FEAC bit codes for "Loop up" and "Loop down" commands are processed.
3. Click **Save**.

Chapter 6

Troubleshooting and Diagnostics

This chapter describes how to:

- Monitor MiRiCi-E3T3 performance
- Display system messages
- Run tests.

6.1 Monitoring Performance

This section explains how to monitor MiRiCi-E3T3 performance.

Displaying Ethernet Statistics

Interface statistical data is collected at the physical level for the Ethernet link. Data can be displayed for the current traffic flow.

➤ **To display Ethernet statistics:**

1. From the Ethernet menu (Monitoring > Physical Ports > Ethernet), select **Statistics**.
2. Click **Refresh** to refresh the screen.

➤ **To clear the Ethernet statistics:**

- In the Ethernet menu (Monitoring > Physical Ports > Ethernet), click **Clear Statistics**.

MiRiCi-E3T3

Monitoring > Physical Ports > Ethernet > Statistics

Counter	RX	TX
Total Frames	289603	5256
Total Octets	21313375	1286394
FCS Errors	0	
Jabber Errors	0	
Pause Frames	0	0
Undersized Frames	0	
Oversized Frames	0	
Unicast Frames	9000	5256
Multicast Frames	42690	0
Broadcast Frames	237913	0
Clear Statistics		

Figure 6-1. Ethernet Current Statistics

Table 6-1 Ethernet Statistics Parameters

Parameter	Description
Counter	RX or TX related counters
Total Frames	The total number of correct frames received
Total Octets	The total number of octets received, including framing characters
FCS Errors	Total number of frames received on a particular interface that is an integral number of octets in length, but do not pass the FCS check. This count does not include frames received with Frame-Too-Long or Frame-Too-Short error
Jabber Errors	Total number of long frames received with invalid CRC
Pause Frames	
Undersized Frames	Total number of received short frames with size under 64 bytes and with valid CRC
Oversized Frames	Total number of received long frames with size over 1518 bytes and with valid CRC
Unicast Frames	Total number of unicast received frames
Multicast Frames	Total number of multicast received frames
Broadcast Frames	Total number of broadcast received frames

Displaying E3/T3 Statistics

Interface statistical data is collected at the physical level for E3/T3 link. Data can be displayed for the current traffic flow and current and previous 15-minute intervals.

► **To display T3 statistics:**

1. From the T3 menu (Monitoring > Physical Ports > T3), select one of the following:
 - **Current** – the statistics collected during the last second (*Figure 6-2*).
 - **15 min** – the statistics collected during the current 15 minute interval.
2. Click **Refresh** to refresh the screen.

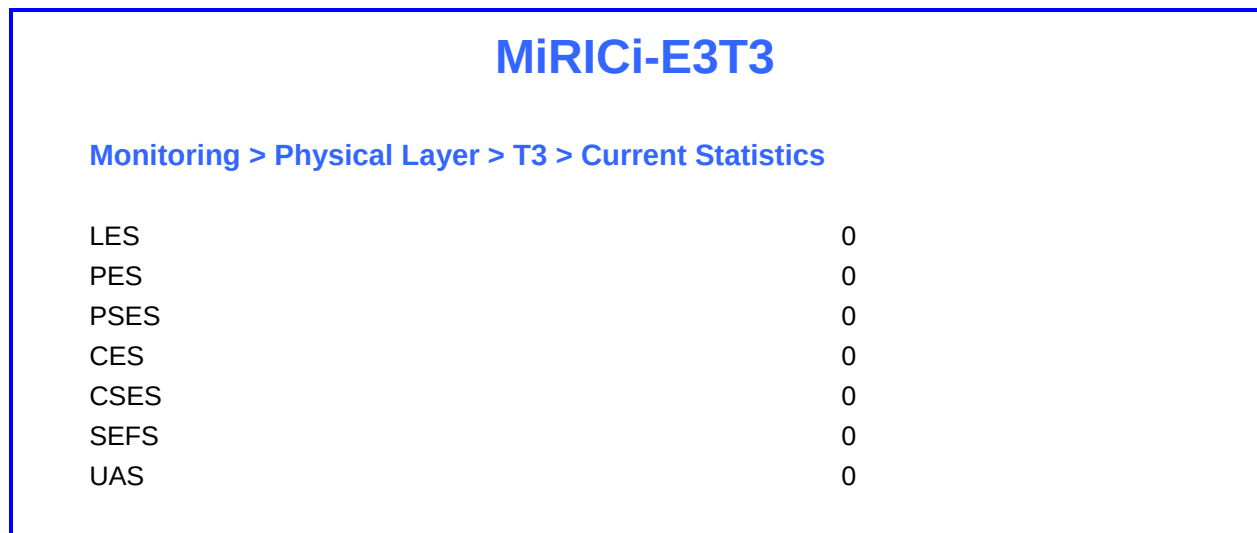


Figure 6-2. T3 Current Statistics

Table 6-2. T3 Statistics Parameters

Parameter	Description
Time elapsed	Displays number of seconds passed from the start time of the interval
LES	Line Error Seconds. An LES is a second during which at least one code violation occurred.
PES	P-bit Error Seconds. A PES is a second during which at least one P-bit code violation (PCV), one out of frame defect or an incoming alarm identification signal (AIS) have been detected. This counter is not incremented when UASs are counted.
PSES	P-bit Severe Error Seconds. A PSES is a second during which at least 44 PCVs, at least one Out of Frame defect or an incoming AIS have been detected. This counter is not incremented when UASs are counted.
CES	C-bit Error Seconds. A CES is a second during which at least one C-code violation (CCV), one Out of Frame defect or an incoming Alarm indication signal have been detected. This count applies

Parameter	Description
	for SYNTRAN and C-bit Parity DS3 applications. It is not incremented when UASs are counted.
CSES	C-bit Severe Error Seconds. A CSES is a second during which at least 44 CCVs, at least one Out of Frame defect or an incoming AIS have been detected. This counter is not incremented when UASs are counted.
SEFS	SEFS are seconds with at least one Out of Frame defect or a detected incoming alarm indication signal (AIS). This item is not incremented during unavailable seconds.
UAS	Unavailable Seconds. This value represents the seconds during which the interface has been unavailable.

► To clear the T3 statistics:

- In the T3 menu (Monitoring > Physical Ports > T3), click **Clear Statistics**.

6.2 Detecting Errors

The following methods are available to detect errors in MiRiCi-E3T3:

- Check the device LEDs (refer to [Chapter 3](#))
- View the event log (refer to [Displaying Events](#))
- Alarms (traps) sent to network manager stations (refer to [Traps Generated by MiRiCi-E3T3](#)).

6.3 Handling Alarms and Traps

MiRiCi-E3T3 maintains a log file that can hold up to 100 events (system messages). All events are time stamped and contain a severity indication. Refer to [Table 6-3](#) for a list of events generated by MiRiCi-E3T3.

Displaying Events

You can view the event log.

- **To access the log file:**
 - In the System menu, select **Log File**.

The Log File screen appears.

MiRiCi-E3T3			
Monitoring > System > Log File			
Current Time: 12:15:42			
Code	Description	Severity	Time
3	LOS_ON:	1	00:00:00
1	LINK_UP: Ethernet Port	1	00:00:00
5	LOF_ON:	1	00:00:00
9	RDI_ON:	1	00:00:00
11	OOF_ON:	1	00:00:00
Clear Table			

Figure 6-3. Log File Screen with Events

Table 6-3. Event List

Parameter	Description
AIS_ON, AIS_OFF	Alarm indication signal; alarm triggered (ON), alarm turned off (OFF)
BPV_ON, BPV_OFF	Bipolar violation encountered (ON), resolved (OFF)
CCV_ON, CCV_OFF	C-bit coding violation encountered (ON), resolved (OFF)
EXZ_ON, EXZ_OFF	Excessive zeroes encountered (ON), resolved (OFF)
LCV_ON, LCV_OFF	Line coding violation encountered (ON), resolved (OFF)
LOF_ON, LOF_OFF	Loss of frame encountered (ON), resolved (OFF)
LOS_ON, LOS_OFF	Loss of Signal encountered (ON), resolved (OFF)
OOF_ON, OOF_OFF	Out of frame encountered (ON), resolved (OFF)

Parameter	Description
RDI_ON, RDI_OFF	Remote detection indication enabled (ON), disabled (OFF)
RLOL_ON, RLOL_OFF	LIU is out of lock (ON)
TX-DISABLE_ON, TX_DISABLE_OFF	The Tx connection has been disabled (ON), enabled (OFF).
PCV_ON, PCV_OFF	P-bit coding violation encountered (ON), resolved (OFF)

Clearing Events

- To clear the log file:
 - In the Log File menu, click **Clear Table**.

All events are deleted from the log file.

Traps Generated by MiRiCi-E3T3

You can define up to 10 network managers to which MiRiCi-E3T3 sends traps. For each management station, you can enable or disable sending traps. Refer to [Chapter 4](#) for details on defining network management stations. Refer to [Table 6-4](#) for a list of traps generated by MiRiCi-E3T3.

Table 6-4. Trap List

MIB	Trap	Description	OID
General	rfc3418.coldStart	The unit has been restarted	1.3.6.1.6.3.1.1.5.1
	rfc2863.linkUp	Interface (Ethernet or E3/T3) has been connected	1.3.6.1.6.3.1.1.5.4
	rfc2863.linkDown	Interface (Ethernet or E3/T3) has been disconnected	1.3.6.1.6.3.1.1.5.3
	rfc3418.authenticationFailure	User authentication has failed due to attempt to access device with wrong SNMP community	1.3.6.1.6.3.1.1.5.5
RFC 2496	dsx3LineStatusChange	E3/T3 line status has changed	1.3.6.1.2.1.10.30.15.0.1

6.4 Testing the Unit

Diagnostic capabilities of MiRiCi-E3T3 include:

- Activating loopbacks (local and remote)
- Responding to T3 inband loopback activation code
- Sending RDI or ASI signals to the TDM equipment.

Running Diagnostic Loopbacks

➤ To run a loopback:

1. From the Diagnostics menu, select **Loopback State**, and choose the desired loopback (Local or Remote).
2. In the Loop Time Out field, enter a period of time (in seconds), after which the loopback is automatically disabled. Setting the timeout to **0** disables the loop.

Note Only one loopback can be run at the time.

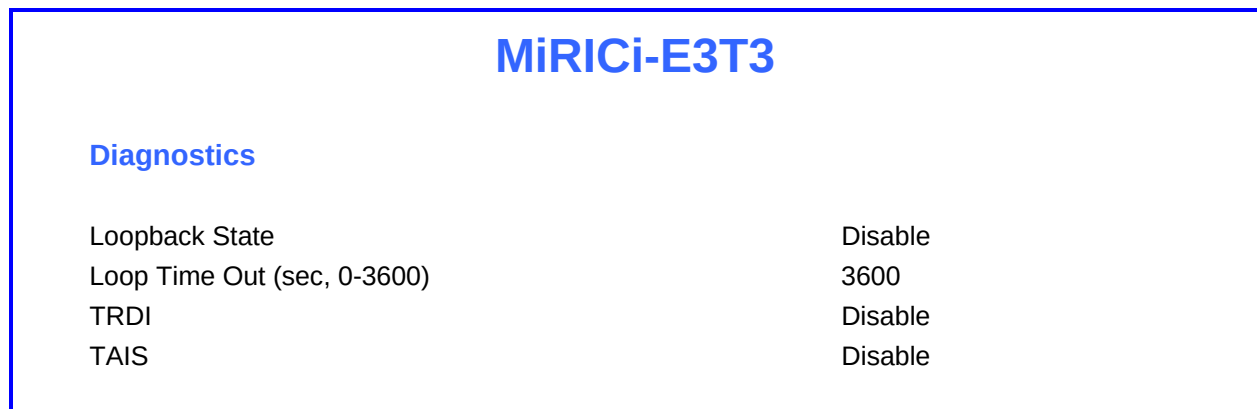


Figure 6-4. Diagnostic Menu

➤ To disable a loopback:

- From the Diagnostics menu, set the loopback state to **Disable**.

Local Loopback

MiRiCi-E3T3 can be set to start a local loopback to test the connection between the E3/T3 port and the host. In this mode, data coming from the host is both looped back to the host and transmitted towards the WAN.

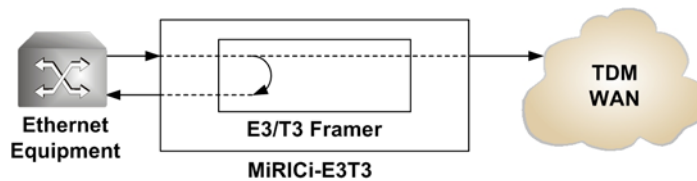


Figure 6-5. Local Loopback

Note Local loopback can be activated when MiRiCi-E3T3 operates with the internal clock.

Remote Loopback

MiRiCi-E3T3 can be set to start a remote loopback to test the connection between the E3/T3 port and the WAN. In this mode, data coming from the WAN is both looped back to the WAN and transmitted towards the host connected to the E3/T3 port.

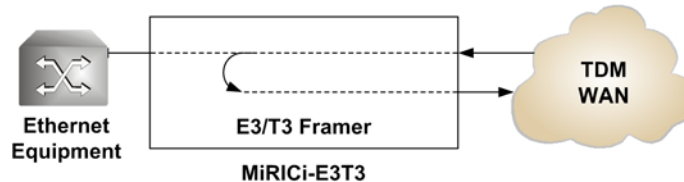


Figure 6-6. Remote Loopback

Activating T3 Inband Loopbacks

T3 physical loopbacks can be activated by receiving a loopback activation code from the TDM equipment connected to the T3 port. When MiRiCi-E3T3 receives a loopback activation code, it closes a remote loopback.

Sending RDI or AIS to the TDM Equipment

MiRiCi-E3T3 can be configured to transmit RDI and AIS indications to the TDM equipment connected to the E3/T3 port.

► To transmit RDI or AIS to the TDM equipment:

- From the Diagnostics menu, set **TRDI** or **TAIS** to **Enable**.

MiRiCi-E3T3 starts inserting RDI or AIS into TDM data that are sent to the adjacent E3/T3 device.

6.5 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the [RAD distributor](#) nearest you or one of [RAD's offices](#) worldwide.

Appendix A

Connector Wiring

A.1 SFP Connector

The MSA-compatible SFP connector is wired in accordance with [Table A-1](#).

Table A-1. SFP Connector Pinout

Pin	Name	Function
1	VeeT	Transmitter Ground
2	Tx Fault	NA
3	Tx Disable	Transmitter Disable
4	MOD-DEF2	Module Definition 2
5	MOD-DEF1	Module Definition 1
6	MOD-DEF0	Module Definition 0
7	Rate Select	NA
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inv. Received Data Out
13	RD+	Received Data Out
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmit Data In
19	TD-	Inv. Transmit Data In
20	VeeT	Transmitter Ground

Appendix B

Upgrading Software

This section explains how to download and activate a new software version of MiRiCi-E3T3 by using the HyperTerminal application and the SFP-CA adaptor.

B.1 Configuring HyperTerminal

Upgrading MiRiCi-E3T3 requires a PC with Windows XP SP2 installed, and equipped with at least one available USB port, and the SFP-CA adaptor. The HyperTerminal application is part of the Windows XP operating system. You must configure HyperTerminal parameters before performing the software upgrade.

Note *Before you can use SFP-CA with MiRiCi-E3T3, you must install the SFP-CA driver and configure the PC network parameters. Refer to [Chapter 3](#) for instructions.*

► **To establish a HyperTerminal connection:**

1. Connect the SFP-CA configuration module to a PC's USB port as explained on the previous page, using the SFP-CA configuration module's USB connector.
New hardware is detected.
2. Before you insert MiRiCi-E3T3 into the SFP-CA configuration module, open the HyperTerminal application.
The Connection Description dialog box for a new connection appears.
3. Specify a name for the HyperTerminal connection, and click **OK**.
The Connect To dialog box appears.
4. Choose a virtual COM port, for example **COM8** and click **OK**.
COM Properties appear.
5. Specify the settings as listed below and then click **OK**.
 - Bits Per Content: **115200**
 - Data Bits: **8**
 - Parity: **None**
 - Stop Bits: **1**
 - Flow Control: **None**.
6. Click **Properties**.
The Connection Properties screen appears.

7. Select the Settings tab and under **Emulation**, choose **VT100**, and then click **OK**.

The COM port configuration is complete, and the HyperTerminal connection is ready for use.

8. Close HyperTerminal.

B.2 Downloading and Installing Software

Once HyperTerminal is ready to communicate with MiRiCi-E3T3 via SFP-CA and you have verified the location of the upgrade image file, you can download the software and upgrade MiRiCi-E3T3.

► **To download and upgrade the MiRiCi-E3T3 software:**

1. Verify that the upgrade image file provided to you is accessible from your PC.
2. Set MiRiCi-E3T3's DIP switches to SW Download (SW DNLD) mode and then plug the MiRiCi-E3T3 device into the SFP-CA configuration module's SFP port.
3. Open HyperTerminal and load the HyperTerminal connection you established.

The first screen appears indicating that the system is ready for downloading.

```

=====
=                (C) RAD Data Communication                =
=                                                         =
=                Software Download    ( version X.XX)      =
=                                                         =
=                                                         =
=====

1 - Download an application by YMODEM

```

Note

- *MiRiCi-E3T3 is automatically upgraded once the new image file has been downloaded.*
- *If you plug MiRiCi-E3T3 in before connecting the SFP-CA unit to the PC, only the Download message appears. The upgrade is correctly performed.*

4. Press <1>.

A warning appears indicating that the disk will be modified.

5. Press <Y>.

Sectors are erased and the Send File screen appears, prompting you to specify the name and the location of the upgrade image file.

6. In the toolbar, click **Send File**.

The Send File screen appears.

7. In the Send File window, under **Protocol**, choose **Ymodem** from the list.

8. Under **Filename**, click **Browse** to navigate to the desired upgrade image file.
 - To start downloading, click **Send**; the Progress screen appears, reflecting the progress of the download. A message will indicate once the download was completed or failed.
 - To close the screen but continue downloading, click **Close** after you clicked **Send**.
 - To cancel the download after you started downloading (sending), click **Cancel**.
 - To abort the download and restore the previous state, press <A>.

Appendix C

I2C Interface Management

This chapter provides references for using the I²C interface and associated commands.

C.1 Two Wire Serial Link

MiRiCi-E3T3 complies with the MSA standard and has the same 2-wire serial link interface (I²C) that carries the out-of-band protocol. The device follows the basic parameter map as outlined by the MSA (based on SFF 8472). [Figure C-1](#) illustrates the mapping of page A0 as seen by the host equipment.

The MiRiCi-E3T3 identification parameters reside on page A0.

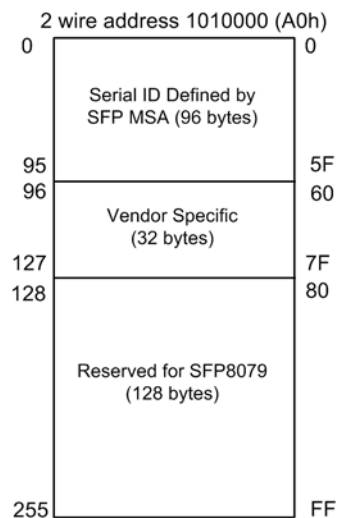


Figure C-1. Page A0 Mapping

The first sector contains addresses 0x00-0x5F that are reserved for identification parameters.

The second sector contains addresses 0x60 to 0x7E that are reserved for vendor specifics.

MiRiCi-E3T3 uses sixteen locations in the third sector (addresses 0x80 and up) for configuration, diagnostic, and status monitoring parameters.

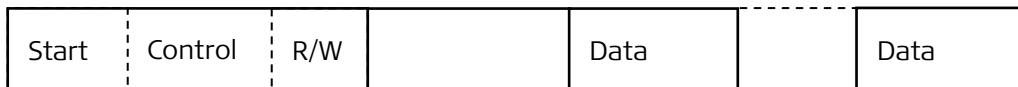
MiRiCi-E3T3 processes two message formats:

- **Two wire serial link message.** Used in standard I²C to read the ID table parameters.
- **Management message.** The host sends information to MiRiCi-E3T3, encapsulated in the I²C message for managing, configuring, and monitoring MiRiCi-E3T3.

Addresses and values are provided in hexadecimal format.

C.2 Serial Link Message Format

This message format defines the structure used to read the ID table parameters.



The process of reading the ID table parameters complies with the MSA document and consists of two main steps:

1. Write message from the host:
 - Includes I²C Control and Write bits in the first byte.
 - The Slave Address byte includes 0xA0h.
 - The Data byte includes 0x00, the first address to be read.
2. Read message from the host:
 - Includes I²C Control and Read bits in the first byte.
 - MiRiCi-E3T3 replies with acknowledgement (zero).
 - The Data byte is clocked out from MiRiCi-E3T3 to the host.
 - The host acknowledges each byte or replies with STOP to terminate the process.

Management Message Format

Two types of I²C message structures are transferred from the host to MiRiCi-E3T3 and vice versa see [Figure C-2](#).

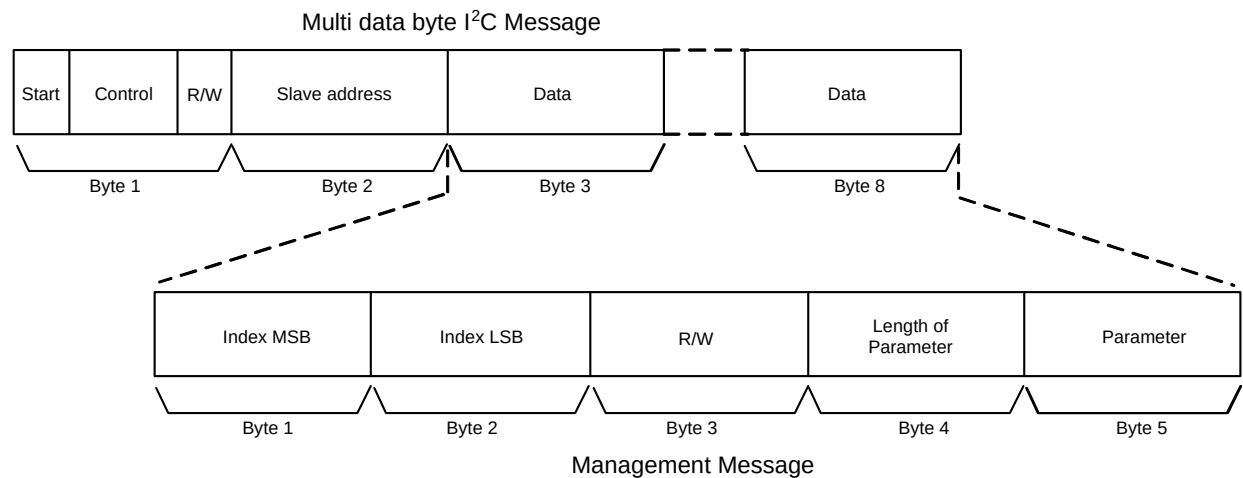


Figure C-2. Management Message Encapsulated in the Multi-Data byte I²C Message

The management message is encapsulated in the Data bytes of the I²C message (bytes 3-8). The slave address points to the reserved area in page 0 of the identification memory (addresses 0x80 to 0x9E).

The data bytes of the I²C message carry the message from the host to the MiRiCi-E3T3 device.

The host message structure may be a write message such as a configuration message or a read message like status. Messages are sent to MiRiCi-E3T3 in the format shown as described in [Figure C-3](#).

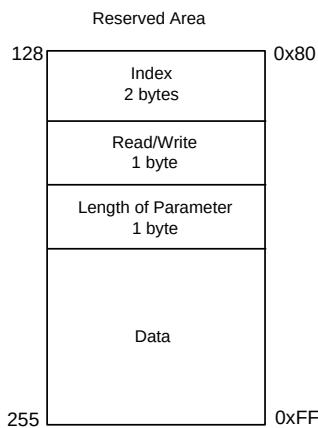


Figure C-3. Message Format

Index: written into addresses 0x80 and 0x81 – The Index bytes determine the command code of the host message.

Read/Write: written into address 0x82 – This byte determines if the command is a read or write operation.

Length: written into address 0x83 is the number of bytes the parameter comprises.

Parameter: written into addresses from 0x84. The parameter length must be exactly as defined in the Length field. Each I²C message will carry up to eight bytes of management message.

Once the full message is stored, MiRiCi-E3T3 reads the message and responds with the respective read or write operation.

C.3 Management Procedure

The host is defined as the master and MiRiCi-E3T3 is the slave, only the host can start the management communication procedure.

The host accesses addresses 0x80–0x9E, in the same way that it accesses the SFP identification addresses (0x00–0x5F).

I²C messages from the host are composed from read and write messages. In a read command, the read parameters (Index, R/W, and Length) are stored at addresses 0x80–0x83. Afterwards, MiRiCi-E3T3 receives the required data and stores it in address 0x84. The complete message is then delivered via I²C to the host.

Read Message

I²C encapsulation structure:

- Includes I²C Control and Write bits in the first byte.
- Next byte contains 0x80 (as the first address).
- Next byte with the First byte of the Index (MSB).
- Next byte with the Second byte of the Index (LSB).
- Next byte contains 0x01 for a read operation.
- Byte contains 0x01 for the Length.
- MiRiCi-E3T3 gets the required data byte and stores it in address 0x84.

To read the required byte, the host sends a new I²C message with the following structure:

- I²C Control bits and Read bits in the first byte.
- Next byte contains 0x84 (the address that the parameter is read from).
- The content of address 0x84 is delivered to the host equipment.

Note

In the event that two or more bytes are to be read, two I²C messages are required to read addresses 0x84, 0x85, etc.

Write Message

I²C encapsulation structure:

- I²C Control and Write bits in the first byte.
- Next byte is 0x80 (the first address).
- Next byte contains the first byte of the Index (MSB) parameter.
- Next byte contains the second Index byte (LSB) parameter.
- Next byte is 0x00 for a write code operation.
- Byte with content of 0x01 for the Length.

From this stage the number of writes depends on the Length field.

Note

MiRiCi-E3T3 handles the write message only if the number of parameter bytes is equal to the Length field.

C.4 Parameters

This section explains how to configure parameters.

General Parameters

The following tasks can be performed:

- Identify if MiRiCi-E3T3 is set to E3 or T3.
- Read the software version X.YZR, where each character in the version number is one byte.
- Reset the software.
- Reset to factory defaults
- Configure the I²C cycle stretching mode.

Table C-1. General Parameters

Index	R/W	Parameter Length	Value	Description
0x1	R	1	0x03 = MiRiCi/FE E3 0x04 = MiRiCi/FE T3 0x0a = MiRiCi/GE E3 0x0b = MiRiCi/GE T3	E3 or T3
0x2	R	1	0x00–0xFF	Software version X.YZR
0x3	R	1	0x00–0x63	Software version X.YZR

Index	R/W	Parameter Length	Value	Description
0x4	R	R	All values are in ASCII code A = Alpha 0x41 B = Beta 0x42 D = Development 0x44 E = End of development 0x45 NULL = Official release 0x00	Software version X.YZR
0x5	R	R	0x00–0x63	Software version X.YZR
0x6	R	1	0x00–0xFF	HW version X.YZR
0x7	R	1	0x00–0x63	HW version X.YZR
0x8	R	1	All values are in ASCII code A = Alpha 0x41 B = Beta 0x42 D = Development 0x44 E = End of development 0x45 NULL = Official release 0x00	HW version X.YZR
0x9	R	1	0x00–0x63	HW version X.YZR
0xa	R	1	0x00–0xFF	Boot version X.YZR
0xb	R	1	0x00–0x63	Boot version X.YZR
0xc	R	1	All values are in ASCII code A = Alpha 0x41 B = Beta 0x42 D = Development 0x44 E = End of development 0x45 NULL = Official release 0x00	Boot version X.YZR
0xd	R	1	0x00–0x63	Boot version X.YZR
0x14	R	6		Mac Address
0x15	R	4	0-0xffffffff seconds	Sys Up Time
0x12C	W	1	0x01 - HW Reset 0x02 - software reset 0x03 - set to factory default	SW reset and factory default
0x12D	R+W	12	Host IP address, default gateway and mask: Bytes 0-3, IP address Bytes 4-7, Default gateway Bytes 8-11, Mask	Defaults: IP: 192.168.205.1 Default gateway: 0.0.0.0 Mask: 255.255.255.0

Index	R/W	Parameter Length	Value	Description
0x12E	R+W	4	VLAN management: Byte 0: 0 – disable VLAN management 1 – enable VLAN management Bytes 1-2, VLAN ID 0-4094 Byte 3, Priority 0-7	Default: 0 – disable VLAN management 1 – ID 0 – Priority
0x12f	R+W	1	Management access Digit0 = WAN Digit1 = LAN 0 = Disable 1 = Enable	Default: 0x3 Enable management via LAN and WAN.
0x130	R+W	1	I ² C cycle stretching mode 0 = Without stretching 1 = Normal	Default: 0x1 I ² C – Normal operation.
0x134	R+W	4	Loop Detect VLAN Bytes 0 = LAN Loop Detect Bytes 1-2 = VLAN Id 1-4095 Bytes 3 = WAN Loop Detect 0 = Disable 1 = Enable	0 – Disable
0x140	R+W	4	VLAN Stacking Bytes 0 = VLAN Tag Stacking Bytes 1-2 = VLAN Id 0-4095 Bytes 3 = Priroity 0-7 0 = Disable 1 = Enable	0 = Disable

I²C Cycle Stretching

The I²C specifications allow the slave (SFP) to elongate read or write cycles executed by the host, by pulling the clock signal down. This indicates to the host that the SFP is not ready to complete the cycle. Some host equipment does not support this cycle stretching functionality. To handle those cases, MiRiCi-E3T3 can be configured to work with or without cycle stretching functionality.

During the first five seconds after MiRiCi-E3T3 is inserted into the host SFP socket, MiRiCi-E3T3 responds to I²C messages without using cycle stretching functionality. After the first five seconds MiRiCi-E3T3 handles I²C messages according to the configured I²C cycle stretching mode:

- Normal operation – MiRiCi-E3T3 users I²C cycle stretching. This is the default mode.
- Without stretching – MiRiCi-E3T3 responds to messages from the host without using cycle stretching functionality. This allows hosts that do not

support cycle stretching to operate successfully, with the minimum of error cycles.

Status Parameters

The following status parameters are available for reading:

- Loss of Rx signal (LOS)
- Alarm indication signal (AIS)
- Remote defect identification (RDI)
- Loss of frame (LOF)
- Bipolar violation (BPV)
- Excessive zero (EXZ)
- The LIU is out of lock (RLOL).

Table C-2. Status Parameters

Index	R/W	Parameter Length	Description
0x3E9	R	1	Ethernet and SFP Status 1 = Active 0 = Inactive Digit0 = Ethernet status Digit1 = Tx Disable
0x3EC	R	1	E3/T3 Status 1 = Active 0 = Inactive Digit0 = LOS (Loss of Rx signal) Digit1 = OOF Digit2 = AIS (Alarm indication signal) Digit3 = RDI (Remote defect identification) Digit4 = LOF (Loss of frame) Digit5 = SLARP SYNC (cHDLC Sync) FEAC (GFP) Digit6 = wan Loop Detected Digit7 = LAN Loop Detected
0x3ED	R	1	E3/T3 Status 1 = Active 0 = Inactive Digit1 = BPV (Bipolar violation) Digit3 = EXZ (Excessive zero) Digit4 = RLOL (The LIU is out of lock) Digit5 = LCV Digit6 = PCV Digit7 = CCV
0x410	R/W	12	SysDescr1 – SNMP string
0x411	R/W	12	SysDescr2 – SNMP string
0x412	R/W	2	SysDescr3 – SNMP string

Index	R/W	Parameter Length	Description
0x413	R/W	12	SysContact1 – SNMP string
0x414	R/W	12	SysContact2 – SNMP string
0x415	R/W	2	SysContact3 – SNMP string
0x416	R/W	12	SysName1 – SNMP string
0x417	R/W	12	SysName2 – SNMP string
0x418	R/W	2	SysName3 – SNMP string
0x419	R/W	12	SysLocation1 – SNMP string
0x41a	R/W	12	SysLocation2 – SNMP string
0x41b	R/W	2	SysLocation3 – SNMP string

Configuration Parameters

You can configure the following parameters:

- TLB0 (T3 only), Transmit line build out
- TXP and TXN signals ~225 feet of cable or full amplitude
- Framed
- Line code:
B3ZS or AMI for T3
- Clock, Rx clock or internal clock
- TRDI, Normal operation or send RDI alarm

Configuration parameters are detailed in [Table C-3](#).

Table C-3. Configuration Parameters

Index	R/W	Parameter Length	Description	Default
0x517	R+W	1	FEAC loop code: (T3 only) 0 = Disable 1 = Enable	1 = Enable
0x519	R+W	1	Digit 0, TLB0 (T3 only) - Transmit line build out: 0 = TXP and TXN full amplitude 1 = TXP and TXN signals ~225 feet of cable Digit 1, Framed/Unframed 0 = Unframed 1 = Framed Digit 2, Line code: 0 = B3ZS (T3) or HDB3 (E3) 1 = AMI	E3: XXXX 000X Digit 1 = 0, unframed Digit 2 = 0, HDB3 Digit 3 = 0, Rx clock Digit 7 = 1, Up T3: XXXX 0011 Digit 0 = 1, ~225 feet of cable Digit 1 = 1, framed Digit 2 = 0, B3ZS Digit 3 = 0, Rx clock Digit 7 = 1, Up

Index	R/W	Parameter Length	Description	Default
			Digit 3, Tx Clock: 0 = Rx clock 1 = Internal clock Digit 7, Interface Admin Status: 0 = Down 1 = Up	
0x51A	R+W	1	Digit 0, TRDI: 0 = Normal operation 1 = Sends RDI alarm.	XXXX XXX0: Normal operation
0x531	R+W	1	Fault Propagation caused by: Digit 0, LOS Digit 1, RLOL Digit 2, AIS Digit 3, RDI Digit 4, LOF Digit 5, FEAC	0 = Disable
0x532	R+W	1	Tx_disable behavior: 00 = NA – no impact 01 = 3 State 02 = AIS	0 = No impact
0x534	R+W	1	Flow Control: 0 = Disable 1 = Enable	1 = Enable
0x535	R+W	2	Fault Propagation Time Out: 0 – 3600 seconds	0
0x536	R+W	1	VCAT overhead 0 = Disable 1 = Enable	0 = Disable
0x537	R+W	1	LOS Behavior caused by: Digit 0, LOS Digit 1, RLOL Digit 2, AIS Digit 3, RDI	0 = Disable
0x538	R+W	1	GFP Payload FCS 0 = Disable 1 = Enable	0 = Disable
0x539	R+W	1	GFP with scrambler 0 = Disable 1 = Enable	1 = Enable
0x540	R+W	1	Protocol 0 = HDLC 1 = GFP 2 = cHDLC	For E3 0 = HDLC For T3

Index	R/W	Parameter Length	Description	Default
				1 = GFP
0x541	R	1	Ethernet Rate 0 = 100 Mbs 1 = 1000 Mbs	
0x542	R+W	1	Line type E3: 0 = G.751 1 = G.832 2 = Unframed T3: 0 = CBIT 1 = M23 2 = Unframed	For E3 2 = Unframed For T3: 0 = CBIT
0x544	R+W	1	GFP Keep Alive 0 = Disable 1 = Enable	Disable GFP T3 only
0x545	R+W	1	Interface Type 0 = E3 1 = T3	1 = T3
0x5B0	R+W	2	QOS 802.1p D0-D1 = Vlan Priority 0 D2-D3 = Vlan Priority 1 D4-D5 = Vlan Priority 2 D6-D7 = Vlan Priority 3 D8-D9 = Vlan Priority 4 D10-D11 = Vlan Priority 5 D12-D13 = Vlan Priority 6 D14-D15 = Vlan Priority 7	
0x5B1	R+W	4	ManagerIP_1	
0x5B2	R+W	4	ManagerIP_2	
0x5B3	R+W	4	ManagerIP_3	
0x5B4	R+W	4	ManagerIP_4	
0x5B5	R+W	4	ManagerIP_5	
0x5B6	R+W	4	ManagerIP_6	
0x5B7	R+W	4	ManagerIP_7	
0x5B8	R+W	4	ManagerIP_8	
0x5B9	R+W	4	ManagerIP_9	
0x5BA	R+W	4	ManagerIP_10	
0x5BB	R+W	1	ManagerIP_selec_1 0 = Disable	0 = Disable

Index	R/W	Parameter Length	Description	Default
			1 = Enable	
0x5BC	R+W	1	ManagerIP_selec_2 0 = Disable 1 = Enable	0 = Disable
0x5BD	R+W	1	ManagerIP_selec_3 0 = Disable 1 = Enable	0 = Disable
0x5BE	R+W	1	ManagerIP_selec_4 0 = Disable 1 = Enable	0 = Disable
0x5BF	R+W	1	ManagerIP_selec_5 0 = Disable 1 = Enable	0 = Disable
0x5C0	R+W	1	ManagerIP_selec_6 0 = Disable 1 = Enable	0 = Disable
0x5C1	R+W	1	ManagerIP_selec_7 0 = Disable 1 = Enable	0 = Disable
0x5C2	R+W	1	ManagerIP_selec_8 0 = Disable 1 = Enable	0 = Disable
0x5C3	R+W	1	ManagerIP_selec_9 0 = Disable 1 = Enable	0 = Disable
0x5C4	R+W	1	ManagerIP_selec_10 0 = Disable 1 = Enable	0 = Disable

Statistic Parameters

The statistics below are updated once a second. It is the host's responsibility to poll the statistics and to calculate the intervals. Two bytes are reserved for each counter.

Table C-4. Statistic Parameters

Index	R/W	Parameter Length	Description	E3/T3
0x6A4	R	1	RBPVCR1	T3
0x6A5	R	1	RBPVCR2: Bipolar violation counter (For HDB3/B3ZS coding only)	T3
0x6A6	R	1	REXZCR1	T3
0x6A7	R	1	REXZCR2: Excessive zeros counter (For HDB3/B3ZS coding only)	T3
0x6B8	R	1	RFECR1	T3
0x6B9	R	1	RFECR2: Receive error framing counter	T3
0x6BA	R	4	RPECR1	T3
0x6BB	R	4	RPECR2: Receive P-bit parity error counter	T3
0x6BC	R	1	RFBECR1	T3
0x6BD	R	1	RFBECR2: Receive far-end block error counter	T3
0x6BE	R	4	RCPECR1	T3
0x6BF	R	4	RCPECR2: Receive C-bit parity error counter	T3
0x6E0	R	1	RFECR1	E3
0x6E1	R	1	RFECR2: Receive Error Framing Counter	E3
0x6E2	R	4	RFECR1	E3
0x6E3	R	4	RFECR2: Receive P-bit parity error counter	E3
0x6E4	R	1	RFECR1	E3
0x6E5	R	1	RFECR2: Receive remote error indication counter	E3
E3	R	4	Current LES	
0x6E7	R	4	15 Min LES	

Index	R/W	Parameter Length	Description	E3/T3
0x6E8	R	4	Current PES	
0x6E9	R	4	15 Min PES	
0x6EA	R	4	Current PSESS	
0x6EB	R	4	15 Min PSESS	
0x6EC	R	4	Current CES	
0x6ED	R	4	15 Min CES	
0x6EE	R	4	Current CSES	
0x6EF	R	4	15 Min CSES	
0x6F0	R	4	Current SEFS	
0x6F1	R	4	15 Min SEFS	
0x6F2	R	4	Current UAS	
0x6F3	R	4	15 Min UAS	
0x6F4	W	1	Clear Statistics	
0x6F5	R	4	Elapsed time (s)	
0x705	R	4	Rx Jabber Errors	
0x706	R	4	Rx Oversized Frames	
0x707	R	4	Rx Undersized Frames	
0x724	W	1	Clear Ethernet Statistics	
0x725	R	8	Total Frames: RX – 4 bytes TX – 4 bytes	
0x726	R	8	Total Octets: RX – 4 bytes TX – 4 bytes	
0x727	R	4	FCS Errors: RX – 4 bytes TX – 4 bytes	
0x728	R	8	Paused Frames: RX – 4 bytes TX – 4 bytes	
0x729	R	8	Unicast Frames: RX – 4 bytes TX – 4 bytes	
0x730	R	8	Multicast Frames: RX – 4 bytes TX – 4 bytes	

Index	R/W	Parameter Length	Description	E3/T3
0x731	R	8	Broadcast Frames: RX – 4 bytes TX – 4 bytes	

Diagnostic Parameters

The following diagnostics are available:

- Normal operation
- Local loopback, LLB
- Remote loopback, RLB
- Transmit AIS, TAIS.

Table C-5. Diagnostic Parameters

Index	R/W	Description	Default
0x708	R + W	0x0000 = Normal operation 0x0100 = LLB 0x0200 = RLB 0x0001 = TAIS	0x0000
0x710	R+W	Loop timeout: 0–3600 s	

C.5 Typical Examples

Reading RFECR1 Statistics for T3

1. I²C Control and Write bits in the first byte
2. Next byte with content of 0x80 (as the first address)
3. Next byte with the First byte of the Index (MSB) – **0x06**
4. Next byte with the Second Index byte of the Index (LSB) – **0xB8**
5. Next byte contains 0x01 for a read operation
6. Byte with content of 0x01 for the Length (in this example the parameter Length is one byte)

To read the required byte, the host sends a new I²C message with the following structure:

1. I²C control bits and read bit in the first byte
2. Next byte with content of 0x84 (for the first address)
3. In response, MiRiCi-E3T3 sends the contents of address 0x84 (message per byte) to the host equipment.

Configuring LLB

1. I²C control and Write bits included in the first byte
2. Next byte is **0x80** (the first address)
3. Next byte contains the first byte of the Index (MSB) parameter – **0x07**
4. Next byte contains the second Index byte (LSB) parameter – **0x08**
5. Next byte is **0x00** for a write code operation
6. Byte with content of **0x01** for the Length
7. Byte with content of **0x01** sets the LLB parameter

C.6 SFP Identification Fields

Table C-6. MiRiCi-E3T3 SFP ID fields

BASE ID FIELDS			
Field Name	Data Address	MIRiCi-E3	MIRiCi-T3
Identifier	0	SFP	SFP
Ext. Identifier	1	04	04
Connector	2	Unknown	Unknown
Transceiver	3	0	0
	4	0	0
	5	0	0
	6	0	0
	7	0	0
	8	0	0
	9	0	0
	10	0	0
Encoding	11	0	0
BR_Nominal	12	0	0
Reserved	13	0	0
Length (90 km)	14	0	0
Length (90 m)	15	0	0
Length (50 m)	16	30	30
Length (62.5 m)	17	0	0
Length (Copper)	18	0	0
Reserved	19	0	0
Vendor Name	20-35	RAD Data Comm	RAD Data Comm
Reserved	36	0	0
Vendor OUI	37-39	0	0
Vendor PN	40-55	MiRiCi-FE-E3 or MiRiCi-GE-E3	MiRiCi-FE-T3 or MiRiCi-GE-T3
Vendor rev	56-59	2.0	2.0
Wavelength	60-62	0	0
CC_BASE	63		

BASE ID FIELDS			
Field Name	Data Address	MIRiCi-E3	MIRiCi-T3
Options	64	0	0
	65	12	12
BR, max	66	0	0
BR, min	67	0	0
Vendor SN	68-83		
Date code	84-91	0	0
Reserved	92-94	0	0
CC_EXT	95		

Note

CC_BASE and CC_EXT are calculated automatically by the MiRiCi-E3T3 software.

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